POPULAR Computing WEEKLY

35p 2-8 June 1983 Vol 2 No 22

This Week

BBC games

John Scriven reviews a range of new games for the BBC including *City Defence*, *Dragon Rider* and *Protector* See page 14.

Election special

Keep track of the general election results with this new program for the ZX Spectrum from David Lawrence on page 17

Dragon graphics

Peter Chase explains how to create and print user-defined graphics on the Dragon See page 22

New releases

Latest software games from a range of companies including *Drone* from Cable Software and *ZX Draughts* from CP Software See page 49

★ STAR GAME ★ New York on Spectrum. See page 10

News Desk

Photograph courtesy of Acorn User

The Electron cometh. . . slowly

THE Electron microcomputer is now expected to be officially launched at the Acorn User Exhibition at the end of August

The machine was originally planned for March at a suggested price of £150 Now the Electron will face stiff competition from other manufacturers, following Sinclair's decision to bring the Spectrum down under £100

Pre-production models of the Electron are now in circulation and more details of the machine are becoming clear Basically a simplified BBC machine the Electron uses the 6502 processor with 32K Ram and 32K Rom It will feature single key-word entry on 29 of the keys for most of the Basic commands A further 10 keys are set aside as function keys The Caps Lock key gives access to the function keys

The casing for the Electron is the same colour as the BBC machine The Electron will also need a separate power supply, to be provided with the machine

New age dawns for Aquarius

MATTEL S family computer, the Aquarius will sell for only £89 99 when it goes on sale in July And its price may be discounted further by retailers

This will make it the lowest-priced colour micro — some £10 cheaper than the Spectrum — and it will be the first micro under £130 to offer a Rom cartridge port

Mattel believes that by pricing the machine aggressively, an extensive user base can be established into which software can then be sold The company has always stressed the importance of software for its Intellivision video games system and plans to launch the Aquarius with a range of cartridge software

Rom software will fall in three distinct price bands — £19 95 and £24 95 (for 8 and 12K Rom cartridges) and £49 95 (for 16K Roms)

Snafu, *Utopia* and *Astrosmash* will be available at the

Continued on page 5

Computer Swap 01-930 3266

Free readers entries to buy or sell a computer Ring 01-930 3266 and give us the details.



DRAGON, MZ80K, RML-380Z, Dragon Flight simulator Excalibur adventure MZ-80K GB Quiz Python RML 380Z high-res Monopoly Flight Simulator card game Backgammon Cheque/PO payable S Hawes £5 each Details SAE 129 Dinas Baglan Road Port Talbot SA12 8DU

ACE SOFTWARE. Seven games for the unexpanded Jupiter Ace only £4 Federation Software 56 Rawley Crescent New Duston Northampton

VIC20 Voodoo Castle £17 or swap for another adventure cartridge Tel 0923 770607

SPECTRUM 16/48K. Amazin games from Alpha Systems' 10 great Arcade games for the price of one! Breakout Gobbler Bomber Death Squad Slots Meteor Swarm and more! All for only £4.50 (inc p&p) Fast delivery Alpha Systems Control 2 Bushshead Cottage Kilmaurs Kilmarnock



BBC B SOFTWARE Congo graphical adventure 16K + 1 and Cowboy Shootout two player game mode 2 graphics sound Death March etc £3 95 each or £6 the pair D Smith 23 Madison Avenue Bournemouth Dorset.

Continued on page 44



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The Team

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Programs should whenever possible be computer printed

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Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

This Week

Editorial

Memotech s decision to launch a new low-cost micro — the MTX500 — at the Earls Court Computer Fair (*Popular Computing Weekly*, 12-18 May) is a brave one

Most of the companies that make add-ons, for the Sinclair ZX81 and Spectrum, have been moving away from hardware into software Quicksilva has dropped its hardware side entirely and now produces software for a growing range of micros DK'Tronics has also entered the software market, as has Kempston

There are a number of reasons for this trend, notably the increasing competitiveness of the micro industry and the profitability of the software sector For a company to buck this trend is either brave or foolhardy

Memotech clearly believes that it has spotted a gap in the market which its new micro will fill Certainly, the specifications are impressive 16K Rom, including both assembler and disassembler, 32K of usable Ram, 16 colours in high-resolution, a proper keyboard and the ability to run CP/M software

Memotech will have to fight for its place in the sun against the likes of Sinclair, Dragon, Atari and Commodore But, given reasonable marketing and distribution, the MTX500 may yet challenge some of the existing micros

Next Thursday

Can you complete the maze and avoid the munchers? Find out next week in Muncher — a PacMan-type game for the 16K ZX81 by S Lancaster.

Also next week, Ian Logan explains how to colour-in circles, triangles and rectangles on the Spectrum

Aquarius

Continued from page 1

launch for £19 95 *Tron Deadly Discs* and *Finform* (a spreadsheet program) will also be available at £24 95 and £49 95, respectively

Other titles will follow In the first price band *Reversi* (November) and *Sea Battle* (November) In the second *Advanced Dungeons and Dragons* (September), *Night Stalker* (October) *Burger Time* (October), *Lock n Chase* (November), *Melody Chase* (November) and *Chess* (November) In the final bend *Fileform* (August) *Extended Basic* (October) and *Logo* (November)

The Aquarius is Z80A-based, with 16 colours, 40 x 24 screen, 4K Ram and 8K Rom As well as taking Rom cartridges the machine is also expandable in Ram up to 52K

Either a 4K (£19 95) or 16K (£49 95) Ram add-on can be plugged directly into the Aquarius Further memory expansion modules can be connected using the Miniexpander unit (£49 95)

Atari and Oric react to micro price-cut

BOTH Atari and Oric have restructured their pricing policies following the fall in the price of the ZX Spectrum

Atari has cut £100 off the price of its 800 machine bringing the price down to £299 99 This follows the decision to upgrade its memory to 48K in February

The price of the Atari 400 computer stays at its February level — £149, but the price also now includes the Atari Programmer kit Basic cartridge, Basic Reference manual and Basic self teaching guide

Oric has declined to cut the price of its 48K machine from its £169 95 pitch choosing instead to offer four free software cassettes worth £40 These are *Home Finance*, *Teach Yourself Basic*, *Oric Flight* and *Multi-games*

Sinclair to set up high technology 'think tank'

SINCLAIR Research is to set up an advanced research centre — a kind of think tank — to explore new areas of high technology

Clive Sinclair, commenting on the decision, said "The centre will not only complement research work underway in the existing computer and television divisions — it will also open up totally new fields ranging from battery technology to robotics "

Based in Cambridge the new Metalab, as it will be called, will receive £2m in backing from Sinclair Research The company has also selected the man to head the development team — Richard Cutting At present he is the managing director of one of the country s most successful and innovative contract research houses, Cambridge Consultants

He reckons that the multidisciplinary team he will set up "represents a new concept for the UK and will offer tremendous possibilities for

Sinclair

Negotiations are now under way to purchase a suitable site for Metalab in Cambridge and it is hoped that the venture will become operational some time in the autumn

Chicago fair debut for MC 10

THIS year s Chicago Consumer Electronics Show — at the McCormick Centre Chicago from June 5 to 11 — looks like being the venue for several major machine launches

Tandy will show its new MC10 Micro Color Computer A cut-down version of the TRS-80 Color Computer the MC10 will sell for $120 (about £76) It has 4K Ram, expandable to 20K in 8K steps, 8 colours and a five-octave sound range

It has single key-stroke entry for Basic commands and a number of pre defined graphics characters accessible using the Shift-lock key Cassette port (1,500 baud) and RS232 interface are included

No UK price has been finalised but the machine is expected over here by October

Both Texas Instruments and Mattel are expected to preview new machines at the show Texas' TI-99/8 will offer 80K for under $500 (about £300) Mattel should show their second computer — up market from the Aquarius

CBS Electronics will display its computer keyboard add-on for the ColecoVision video game system

On the home front, Dragon will show the Dragon 32 following its US tie-up with Tano Acorn will be promoting the BBC machine which has only recently gone on sale in the US and Timex will exhibit the Spectrum equivalent — the TS2000 This latter will be interesting for its differences from its UK counterpart — Rom slot and enhanced sound-handling capabilities, for two

Low-cost printer from Oric

ORIC Products International has announced a new low cost four-colour printer plotter

The unit, called the MCP40, will be priced at £169 95 and will connect to any microcomputer that has a Centronics interface

The four colours – black, blue red and green – are provided by four rolling ball ink pens writing on plain paper four inches wide The MCP40 prints at 12 characters per second with either 40 or 80 characters per line It has three modes – a test mode printing the Ascii character set in four colours, a text mode and a graphics plotting mode

The MCP40 should be available in June from Oric's retail outlets

Atari adaptor disputa settled

LEGAL disagreements over the CBS Electronics ColecoVision/Atari adaptor have now been resolved

Atari claimed trademark and patent infringements by CBS who announced an adaptor for its ColecoVision video games system to enable it to run the full range of Atari VCS software

After Atari filed a $350m US law suit CBS responded with a $500m suit claiming restriction of trade

Now the argument has been settled The stumbling block of CBS s use of Atari s name and logo trademarks has been resolved with CBS giving an undertaking only to refer to the adaptor as the Expansion Module Number 1

Now the launch of the product can go ahead as planned in June It should be available in the UK in the autumn, retailing for around £50 The ColecoVision machine itself will sell for £149 95

● Meanwhile Atari has announced that it will market versions of its best-selling computer games — including *Pac-Man* — to run on a range of machines other than Atari's own *Pac Man* should find its way on to Commodore, Texas Instruments, Tandy, Apple and IBM machines The titles will be available first in the US probably in the autumn

Acorn show

THE Acorn User Exhibition will be held at the Cunard Hotel London W6 on August 25 to 28 Entry to the show will be £2 and £1

Back numbers

I have recently started buying your excellent publication — *Popular Computing Weekly*. In the edition of 14-20 April (Vol 2 No 15) I was interested in the article by Joseph Burr entitled *Another dimension*.

He mentions an article by Ian Reynolds about a 3D graphics program for the ZX Spectrum printed in *Popular Computing Weekly* on 10 September 1982. I wonder if you could inform me if I could obtain a copy of this article.

Tom Drummond
8F Clouden Road
Kildrum
Cumbernauld
Glasgow

Back copies of *Popular Computing Weekly* can be obtained by sending 50p to: Back Numbers, *Popular Computing Weekly*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

Games racer

I am writing to say that the Spectrum users are losing out on one main type of video game. I am a games player and I am very disappointed that the software companies have not yet released a good racing car game.

I have looked all around Liverpool city centre and in all of the magazines and I can't find one. All of you software companies listen to this plea and please, please, please, make a good racing car game.

R Robinson
17 Hurst Park Way
Huyton
Liverpool

Invidia dragonis!

As a consultant clinical psychologist specialising in microcomputer induced neuroses, I was most interested by the letter from your Spectrum using correspondent Andrew Wiseman (5-11 May edition) as clear a case of *invidia dragonis* (envy of the dragon) as I have seen in many a long day.

What is not clear is from what variety of this unfortunate affliction the patient is suffering. We customarily distinguish between seven forms:

(i) Envy of the switches (keyboard, on/off, reset)
(ii) Envy of the sockets (printer, cartridge joysticks, video monitor)
(iii) Envy of superior languages (6809 assembler, Extended Microsoft Color Basic)
(iv) Envy of the video hardware (multiple graphics modes and animation capability)
(v) Envy of the music hardware (6 bit D/A converter with output to TV)
(vi) Envy of the processor power (vide benchmark tests)
(vii) Envy of expansion capability (Real discs, OS9, Flex etc).

What is certain in an advanced case like this is that the patient must at all costs be shielded from exposure to the BBC model B or 80-Bus or other versatile systems. Failure to protect the patient can result in gross delusions about controlling power stations or running business software, etc, recovery from which is, I regret to say, extremely rare.

James Thomas
London NW4 4XE

Problem solved

No doubt you will have received numerous letters regarding the query from H Hudson (Vol 2 No 19) whose difficulty with identifying perfect squares is explained on pages 169 and 170 of the Spectrum manual. The problem lies in the fact that *Int(Sqr 25)* is stored in the alternative manner described on page 170 which gives a (decimal) sequence of

```
0 0 5 0 0
```

whilst *Sqr 25* is stored as shown on page 166 and detailed on page 169 with a byte sequence of

```
131 32 0 0 1
```

which is equal to *8 × 0.6250000023283064*. Clearly this is *0.00000000186* too large and is recognised as not equal to 5.

The solution lies in defining the limits of accuracy required for example by

```
LET a = 0.00000001
IF INT (SQR N) > SQR N-a AND INT(SQR N) < SQR N +a etc.
```

Trevor Dutt
28 Weymouth Street
London W1N 3AF

Our thanks to Trevor Dutt, for his solution to H Hudson's perfect square dilemma, and to everyone else who wrote in with answers to the problem.

Romeo and Juliet

Would you please give David Hanson (and Tanya Whistler) our thanks for their excellent 16K ZX81 program *Romeo and Juliet*, which successfully combines adventure, romance, great literature and education. It has proved very popular with the class at school, and has intrigued members of the local ZX users club. Good educational programs for the ZX81 aren't that easy to find.

Good luck to your excellent magazine. It seems no time at all since I bought your first issue and my ZX81 simultaneously. Don't forget us ZX81 users. There are about half a million of us after all!

John Little
53 Spring Plat
Pound Hill
Crawley W Sussex

Oric after-sales

There have been letters in both your and other magazines concerning the now infamous delivery problems of the Oric. I've also had my share of Oric's "tell em it's gone to dispatch" technique. But, I wonder if any of your readers have yet experienced Oric's after-sales service.

One week after receiving my (on loan) Oric, the power pack failed. On Monday, April 11 I phoned Oric's service department requesting a replacement. They promised to send it the following afternoon. A week later I phoned again to ask where it had got to. A Mr Atwell said it had been sent on Friday and, before I could complain, put the phone down.

Besides being generally disappointed with the Oric (my Dragon 32 is far superior) I'm not impressed with the quality of a product when a simple transformer only lasts seven days. But as far as "after-sales service" is concerned, it's a disgrace because (surprise) another week has passed and still no power pack.

If I thought I could get my money back before pound coins become obsolete I would.

PS A small tip for those just receiving Orics. If you are unable to tune in the colour, use a non-metallic screwdriver. The colour is lost when any metal touches the adjusting screws. It's something to do with the magnetic fields in the vicinity of the screws.

PPS Great magazine, keep the Dragon page going.

B Wieghell
88 Douglas Road
Acocks Green
Birmingham 27

Where are the hills?

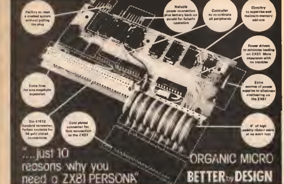
I am a newcomer to computing having recently bought a 48K Spectrum. I was interested recently in the Tony Bridge review of Spectrum software (March 3-9), and bought a *Flight Simulation*.

One query — I have been unable to see the hills through the cockpit windows which I assumed would be visible. The runways and lakes have all been seen (and crashed into!), but on several occasions, I have intentionally tried to view the hills without success, although I have managed to crash into them quite successfully!?!

Is this a fault with the tape, my loading (I have had no real problems otherwise), or are they not in fact visible? By the way, are the beacons supposed to be visible too, or only on the map? I have written to Psion, Melbourne House, but have not received a reply. I look forward to hearing from you.

J F A Hodrien
35 Harcourt Road
Windsor
Berkshire SL4 5LZ

To the best of my knowledge, there is no fault with your tape. The hills are presumably covered in cloud, as no one that I know who has played the game has ever seen the hills, though plenty of people have crashed into them. The same applies to the beacons.



Facility to reset a crashed system without pulling the plug
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New York

A new game for the 16K Spectrum by P Watson

This program is called *New York*. It is basically an invaders-type game for the 16K ZX Spectrum.

First of all instructions are printed on the screen. Next, you input your level of difficulty (best on level 8).

The program then plots some random stars and prints a New York skyline. Your score and difficulty level are printed at the top left-hand corner.

Aliens now start descending from the top of the screen. If they get past your flying disc they crush one skyscraper. If however, they hit your disc they self-destruct.

After 20 aliens have attacked a mother ship will pick up the surviving aliens. When the mothership returns to the left-hand side of the screen, the computer plots some more random stars.

Then, the next attack wave starts. This process is repeated until you only have three skyscrapers left. Then the game ends telling you that a sufficient amount of New York has been destroyed.

List of variables

sc = The score. 1 is added to the score every time an alien is hit.
bh = The bat's height. The bat height moves one line further up the screen after each attack wave.
aw = Determines which attack wave you are on.
k = The x value of the alien.
e = The number of aliens that have actually descended.
i = How many skyscrapers have been demolished.
g = A variable used for a 'for — next' loop when defining the graphics for the skyscrapers.
m = How many stars you get.
u = Height of the buildings.
z = The y value of the buildings.
x = The height of your bat.
y = The distance across the screen of your bat.
t = The y value of the alien.
l = The 'for — next' loop which enables the aliens to descend.
ls = The level of difficulty which you input at the start of a game.
v = A 'for — next' loop which replaces a pause statement. This is because pause statements can be interrupted.
w = The x co-ordinate of the mothership when it is picking up the aliens.
q = The y co-ordinate of the mothership when it is picking up the aliens.
r = The y co-ordinate of the alien as it ascends to the mothership.
h = The y co-ordinate of the mothership when it is returning to the left-hand side of the screen.
b = The variable used in the graphics effect at the end.

The graphics in line 92 are 'D' and 'C' (The skyscraper graphics). Line 210 graphics 'A'. Line 1000, graphics 'BB' (explosion). Line 5015, graphics 'NM' (mothership). Line 5022, graphics 'A'. ■





```
   4 LET j=0
   5 LET sc=0
   6 LET bh=0
   8 LET aw=1
   9 BORDER 0: PAPER 0: INK 7: C
LS
  10 LET k=0
  12 LET c=0
  16 LET i=0
  20 POKE USR "a",BIN 0
  21 POKE USR "a"+1,BIN 01000001
  22 POKE USR "a"+2,BIN 00100010
  23 POKE USR "a"+3,BIN 00011100
  24 POKE USR "a"+4,BIN 00101010
  25 POKE USR "a"+5,BIN 01011101
  26 POKE USR "a"+6,BIN 01001001
  27 POKE USR "a"+7,BIN 01000001
  30 POKE USR "b",BIN 10001000
  31 POKE USR "b"+1,BIN 01101001
  32 POKE USR "b"+2,BIN 10111010
  33 POKE USR "b"+3,BIN 00011100
  34 POKE USR "b"+4,BIN 11111111
  35 POKE USR "b"+5,BIN 11011101
  36 POKE USR "b"+6,BIN 10101110
  37 POKE USR "b"+7,BIN 01101011
  40 FOR g=1 TO 2: READ p$: FOR
f=0 TO 7: READ s: POKE USR p$+f,
s: NEXT f: NEXT g
  41 DATA "c",60,126,153,153,255
,153,153,255
  42 DATA "d",255,153,153,255,25
5,153,153,255
  50 POKE USR "n",BIN 00000001
  51 POKE USR "n"+1,BIN 00000111
  52 POKE USR "n"+2,BIN 00011010
  53 POKE USR "n"+3,BIN 11101010
  54 POKE USR "n"+4,BIN 01111111
  55 POKE USR "n"+5,BIN 00011111
  56 POKE USR "n"+6,BIN 00000011
  57 POKE USR "n"+7,BIN 00000001
  58 POKE USR "m",BIN 10000000
  59 POKE USR "m"+1,BIN 11100000
  60 POKE USR "m"+2,BIN 01011000
  61 POKE USR "m"+3,BIN 01010111
  62 POKE USR "m"+4,BIN 11111110
  63 POKE USR "m"+5,BIN 11111000
  64 POKE USR "m"+6,BIN 11000000
  65 POKE USR "m"+7,BIN 10000000
  75 GO SUB 2000
  85 BORDER 0: PAPER 0: INK 7: C
LS
  88 LET z=0: FOR m=0 TO 50: INK
 INT (RND*6)+1: PLOT BRIGHT 1; IN
T (RND*255),175-INT (RND*125): N
EXT m
  90 INK 7
  91 LET z=z+INT (RND*1)+1
  92 FOR u=21 TO (21-INT (RND*le
)) STEP -1: PRINT AT u,z; INK 4;
 BRIGHT 1;"D": PRINT AT u-1,z; I
NK 4; BRIGHT 1;"C": NEXT u
  93 IF z<=29 THEN GO TO 91
  94 PRINT AT 21,1; INK 4;"
  96 IF aw=0 THEN LET bh=bh+1:
LET x=19-bh: LET y=13
  97 PRINT AT 20,8; INK 6;"
  98 PRINT AT 5,9;"Attack wave "
;aw: LET c=0
  99 PAUSE 100: PRINT AT 5,9;"
"
 100 PRINT AT 0,0; FLASH 1;"Scor
e = ";sc: PRINT FLASH 1;"Level "
;le: LET c=c+1
 101 LET k=0
 102 LET l=INT (RND*29)+1
 103 FOR f=0 TO 21
 104 PRINT AT x,y; INK 2; BRIGHT
 1;"__"
 110 IF INKEY$="q" AND y>1 THEN
LET y=y-2: PRINT AT x,y+2;"  "
 120 IF INKEY$="e" AND y<20 THEN
 LET y=y+2: PRINT AT x,y-2;"  "
 210 PRINT AT k,l; BRIGHT 1;"A"
 215 PRINT AT k-1,l;" "
 220 LET k=k+1
 225 IF k=22 AND c>=20 THEN LET
aw=aw+1: GO TO 5004
 230 IF ATTR (x,y)=71 OR ATTR (x
,y+1)=71 THEN GO TO 1000
 232 IF ATTR (k,l)=4 THEN LET i=
i+1: BEEP .03,30: BEEP .09,49: B
EEP .06,20
 235 IF i=27 THEN GO TO 5000
 240 NEXT f
 500 GO TO 100
1000 BEEP .07,10: PRINT AT x,y;"
00"
1005 LET sc=sc+1
1010 GO TO 100
2000 PRINT "New York by night is
 a typical ": PRINT
2005 PRINT "invader game.The aim
 is to ": PRINT
2010 PRINT "destroy the aliens w
hich are ": PRINT
2015 PRINT "attempting to flatte
n New York.": PRINT
2020 PRINT "You are in control o
f a flying ": PRINT
2025 PRINT "disc which has a ant
imatter ": PRINT
2030 PRINT "surface.The aliens,o
n contact ": PRINT
2035 PRINT "with your disc,self-
destruct.": PRINT
2040 PRINT "Your flight controls
 are.": PRINT
2060 PRINT "Q.....Left,E.....Rig
ht)": PRINT
2070 PRINT : PRINT "Hit any key"
2075 PRINT AT 21,10; INK 3; FLAS
H 1;"Author  P. Watson"
2080 PAUSE 0: CLS
2100 INPUT "Level of Dificulty (
1-8)",le: LET bh=le
2110 IF le<1 OR le>8 THEN GO TO
2100
2300 RETURN
5000 PRINT AT k,l; BRIGHT 1;"A":
 PRINT AT k-1,l;" ": PRINT AT 9,
0; INK 2; BRIGHT 1; FLASH 1;"A s
ufficient amount of New-York has
 been destroyed.The aliens
        are leaving        "
5001 PRINT AT 5,31;" ": PRINT AT
 6,31;" ": PRINT AT 7,31;" "
5004 IF i<>27 THEN PRINT AT 5,0;
 FLASH 1; INK 3;" Attack wave "
;aw-1;" is completed,a    mother
 ship will pick up the    aliens
-Prepare for the next
attack  wave              "
5005 FOR v=0 TO 350: NEXT v
5006 PRINT AT 5,0;"
5008 LET d=31
5010 FOR w=1 TO 29: LET q=2: FOR
 r=21 TO 2 STEP -1
5015 PRINT AT q,w-1;"NM"
5016 IF w>=2 THEN PRINT AT q,w-2
;" "
5018 IF ATTR (21,w)<>71 AND ATTR
 (21,w)<>7 AND ATTR (21,w)<>0 TH
EN NEXT w
5019 IF w>=30 THEN GO TO 5045
5022 PRINT AT r,w;"A"
5025
5031 IF r<=20 THEN PRINT AT r+1,
w;" "
5035 IF r=21 THEN BEEP .02,02: B
EEP .05,45: BEEP .07,5
5040 NEXT r: NEXT w
5045 PRINT AT 2,29;"  "
5050 PRINT AT x,y;"  ": LET h=4:
 FOR t=31 TO 0 STEP -1: PRINT AT
 h,t;"  "
5051 LET h=h+INT (RND*3-1)
5052 INK (RND*7): PLOT BRIGHT 1;
INT (RND*255),175-INT (RND*100):
 INK 7: PRINT AT h,t;"NM ": NEXT
 t
5053 PRINT AT h,0;"  ": IF i<>27
 THEN PAUSE 20: GO TO 94
5055 CLS
5060 INPUT "Another game ";j$
5070 IF j$<>"y" AND j$<>"n" THEN
 GO TO 5060
5075 FOR b=0 TO 224: OUT 254,b:
NEXT b: PRINT AT 10,14;"OK": PAU
SE 150
5080 IF j$="y" THEN RUN
```

WARNING

SPECTRUM-ZAP (2.0) IS NOT A GAME . . .

Spectrum-ZAP (2.0) has been designed to enable you to make copies of your expensive and fragile software. Spectrum-ZAP (2.0) will work on both 16K or 48K Spectrums and since it uses none of the program area will copy a full 16K or 48K machine code or basic tape, even if it cannot be broken into!

SPECTRUM-ZAP (2.0) — £5.95

MAIL ORDER: SCIMITAR SOFTWARE
3 PALACE GATES ROAD, WOOD GREEN,
LONDON N22 4BW



From selected retail stores:

D. J. COMPUTERS, TOWN SQUARE, STEVENAGE
BUFFER SHOP, STREATHAM, LONDON
MICRO-SOURCE ZWOLLE, NEDERLAND
CASTLEHURST, WHETSTONE, LONDON N20

School lessons . . .

***David Kelly** talks to Anita Straker of the Microelectronics Education Programme*

In March, 1980, the Department of Education and Science announced a four year programme of support — worth £9m — for microcomputer education in schools.

The programme to run in parallel with the Department of Industry's Micros in Secondary Schools half-price hardware offer was intended to give teachers both training and software support.

Now that the Department of Industry's discount micros scheme has been extended to include 27 000 primary schools the Microelectronics Education Programme (MEP) has been extended to provide assistence in primary schools.

The MEP Primary Project aims to assist in the development of computer-based learning material and increase awareness of micros simple control technology and information systems in schools.

Anita Straker, formerly General Advisor and Maths and Computing Advisor for Wiltshire Local Education Authority has been appointed as director of the new MEP Primary Project. The project will run for at least two years and this year receives funding in excess of £350,000.

"The people we will be trying to help says Anita, "will be the primary school advisors, LEA advisory teachers, key head teachers and lecturers in teacher training colleges — most of whom have no experience of computing. They can then go back and train the teachers."

Exactly what training will be required is not easy to determine. In such a fast-developing area answers inevitably involve a certain amount of crystal-ball gazing. 'Given the sorts of facilities that schools have they should be teaching computer awareness — computers as everyday objects.

Crystal-ball gazing

"Children in primary schools will also be learning how to instruct the computer. We do not know which language will be used — at primary level it will probably be Logo.

At least the argument about machines is over — the decision has been made. In the primary schools scheme about 80 percent of the micros being purchased under the aegis of the DoI are BBC machines, with smaller numbers of RM 480Zs and smaller numbers still of Spectrums. Other machines purchased by schools prior to the scheme are already over-shadowed and the MEP is only developing software for the three recommended systems. Future machines bought by schools will now almost certainly be one of the machines in the scheme or something compatible, such as the Acorn Electron. It is almost impossible to predict how many computers will be available in primary schools two years from now.

"I would like to see one computer between two classrooms — and possibly more than one keyboard and monitor per machine."

Anita Straker has quite firm views on what the computer should be used for in the classroom. "I would say loosely 60 percent of the time should be spent with computer-based learning, 20 percent problem-solving and writing programs and 20 percent dealing with control applications and elementary electronics. At the same time one hopes that children will develop an awareness of what the computer can and cannot do."

Anita emphasises that this broad balance that the MEP Primary Project is recommending may change and that there is a substantial overlap between the different uses of the micro — but it does give some idea of where the priorities of the Primary project lie.

Another everyday object

"The computer doesn't replace books or films or anything else but takes its place alongside all those and offers new possibilities. Children themselves do not take long to see the computer as just another everyday object — it is the teachers who find it difficult to come to terms with."

One thing Anita is keen to dispel is any suggestion that teachers will be expected to write software. 'We would expect them to gain a familiarity with the machine such that for example, they could change *Data* statements, but not anything much more complicated.'

Anita is critical of much of the software currently being produced by independent suppliers for use in schools. "It is already very easy for children to practice skills of a rather low order. There are a multitude of ways of doing this without using a computer so one ought to do something more profitable with what is still a scarce resource.

'Educationalists are very fearful about the proliferation of low-level practice programs because primary education has moved away from Victorian England.

'The sort of program I mean shows a map of England and the computer flashes 'What is the name of this town?' The child types in Sheffield with one I and the computer won't accept it. If the teacher thinks that sort of thing is educationally desirable then use a chart on the wall and a pointer!

'Children forget most of the facts they ever learn in school anyway. We should be teaching children how to think and how to *find out* information. Take a program like *Eureka* which is designed to encourage



children in graph *interpretation*, not graph *construction*. The screen is divided into two sections. The top half shows a man in a bath and the bottom half draws a graph of water height against time. The idea is that the graph is constructed at the same time as the data is collected.

'As the graph is being drawn the child can turn the taps on or off pull out the plug get the man to step in and out of the bath and even get him to sing. Using the program quite complex concepts can be considered.'

Another example of the computer tackling something that could not be contemplated any other way is the program *Mary Rose*. It uses a graphical display to show the problems faced in trying to raise the Mary Rose warship. Using such a computer simulation is a very good way of beginning an open-ended discussion.

In addition to these kinds of applications, Anita is sure that children will also want to program the computers. "Programming will be seen within the context of a problem-solving tool at primary school level.

"We are not talking about sophisticated levels of programming but more finding simple solutions to simple problems."

The MEP Primary Project certainly has a major role to play in educational computing and things are progressing extremely quickly. In 1980 25 UK primary schools had a computer. Now the figure is more like 15 000. "If we get the same scale of changes in the next three years then anything I have said now will quickly seem ridiculous," says Anita.

Any success that the MEP Primary Project has will have a knock-on effect when pupils reach secondary school age. "The secondaries will be faced with the problem of trying to meet a continuing challenge. Five years ago we were talking about computer awareness for third-year secondary school pupils. Now we must extend the computer awareness of 11-year-olds.

The whole MEP project is really only a pump-priming operation. Eventually the schools will have to stand on their own two feet. The purpose of the MEP at this time is really to provide an influence.' ■

Galaxy of games

***John Scriven** looks at some of the games software now available for the BBC*



Seeing that the BBC micro has such good graphics capability as well as an easily accessible operating system, it is perhaps surprising that it has taken so long for a wide selection of games to become available.

It is possible that games writers see a larger market for their material amongst the ranks of Spectrum owners, or perhaps BBC owners are seen as a more serious bunch, running business programs deep into the night. The truth is, of course, that BBC owners enjoy games just as much as owners of other machines and I'm sure that like me, they are pleased that a range of generally well-written software is now available.

What is less pleasing however is that some of the games show a certain lack of originality, although the majority have been crafted with skill to make them as close to the arcade version as possible.

You may feel that the summit of achievement is to have an arcade game copied precisely, certainly software houses report a resistance to purchasing new and un-tried titles. However, it does seem a little sad that the flower of Britain's programming youth should be spending all their time perfecting copies. It is as if modern playwrights slaved away to produce passable copies of Shakespeare instead of producing new material. In the best of all possible worlds there would be a variety of choices and I'm glad to say that in amongst the copies there are several new ideas.

First of all, the old favourites. There are two versions of Invaders lurking in this batch. I would have thought that any potential alien visitors would have been put off coming to this planet for a few thousand years, but both Bug-Byte and IJK Software have persuaded hordes of them to come sweeping down the confines of your tv screen.

Bug-Byte's *Space Invaders* allows you to choose between one or two players as well as amateur or professional status. As you start, the game appears rather slow but it does warm up considerably before the end and the aliens fairly whiz across the screen when there are only three or four left. The bases are reasonably solid and allow you to hide beneath them while squirting a hail of missiles through a tiny gap. The instructions are clear on both the cassette cover and the screen, and you have the option of using joysticks rather than keyboard keys. Should you be slow in starting the game, the score advance table appears, followed by a demonstration game.

IJK Software's *Invaders* is very much the same, but the bases aren't so protective. Not only do you have a choice of alien speed — in this version you can have fast or slow missiles, fast or slow bombs and the presence of shields is optional. If you are big-headed or maybe just masochistic, you can even play against invisible invaders. Should you live on a small island off the coast of North Scotland and have not yet acquired your copy of Invaders, then either of these versions should suit you very well.

Maze, food pills, ghosts and power pills

Another arcade look-alike is *Bridgeman* from Richard Hine. This is a competent version of *Pacman*, involving the usual maze, food pills, ghosts and power pills. I did not enjoy it as much as *Snapper* from Acornsoft which seems a smoother game.

Bridgeman also suffered from having false instructions on the introductory screen. Keys *Q*, *A*, *Z* and *X* did not steer the player round the screen until different numbers had been inserted into the relevant lines. This is not the most auspicious start to a program. If it is due to a different operating system being employed, then a warning would be useful on the cassette cover; in this case it contains only the names of the game and the supplier. The *Escape* and *Break* keys were also not disabled, an elementary precaution in any BBC program.

If you think that earlier I was rather unkind to arcade look-alikes, then the theme of *Pacman* gives me a good example. *Hungry Horace* for the Spectrum cannot hide his origins, and yet by changing the mazes and the storyline, an amusing and challenging game has been produced, not just another clone.

Now we come to a difficult game — *Galaxy Wars* from Bug-Byte. A stream of alien bombers trail slowly across your screen, occasionally releasing fighters and bombs that threaten to demolish your ship. This can be moved to the left and right by means of the *Tab* and *Q* keys. Firing is achieved by means of the *Copy* key. It is a good point that Bug-Byte use different fire buttons in each game rather than constantly falling back on the *Return* key, which would tend to wear out rather quickly if it was always chosen.

Ridding the skies of this set of aliens is time-consuming and becomes rather boring. Eventually they are replaced by H-wing fighters, fast-moving craft that hang on to you tenaciously. Should you survive this wave, you have to dock with the mother ship for refuelling.

The higher reaches of this game are exciting and need careful control, but it's frustrating to be sent back to the beginning each time, knowing that you have to destroy the bombers before the interesting section begins. If you can put up with this, you will find *Galaxy Wars*, like the other Bug Byte programs, well-written and fully-documented.

It is worth noting that all the Bug-Byte cassettes state on the cover notes that they will operate with all versions of the BBC model B. Several other manufactur-



er's programs will not run if you have the disc or econet interface fitted Although you can reset the bottom of program memory to overlap the disc area, it would be helpful to new owners to have this explained on the cassette cover

One of my favourite arcade games used to be *Missile Command* in which you had to defend a row of cities with three missile bases Alien rockets descend from the skies spinning and splitting into separate war-heads To direct the fire from the three bases you had a target cross on the screen which couldnbe moved by a large ball that spun beneath your fingertips

Most games writers have chosen to ignore this game, due to the control problems involved in converting it to run on a micro Bug-Byte have got round the problem by making only the last rocket fired from any base actually steerable No longer can you employ such strategies as high speed pattern shelling across the screen, and it seems more difficult to achieve a high score One or two players may take part, and their individual scores are shown along the top of the screen Although less exciting than the arcade version, I found it more addictive than *Space Invaders* and *Galaxy Wars*



A less than graceful crash landing

One game that is certainly fast-moving and fun to play is *Planes* from A & F Software This game consists of destroying four screens of planes that swoop at your movable base As well as dropping bombs, they are willing to sacrifice themselves in true kamikazi fashion by ramming your craft

Quick reactions are certainly the order of the day One of the screens contains only helicopters who remain in the air but deposit a lethal rain of bombs on you There are two speeds, slow and fast The slow setting seemed just about possible but the fast mode is reserved for true arcade heroes — an entertaining game

Protector, written by Andy Green under the Quicksilva label is the only game that cannot be played without joysticks Your task is to protect 16 units in the centre of the screen from marauding space thieves You can do this by colliding with them

Other nasties that appear are mine-laying saucers and monsters, but it is fatal to collide with these Each time you clear a screen, their number increases until you lose three lives or have all your units stolen This may be a copy of some obscure game, but I cannot recall seeing it in any arcade, and Quicksilva are to be commended for their originality

Two games that are certainly to be found in no arcade this side of Alpha Centauri come from two south coast firms Their roots lie in English mythology and one could imagine the knights of King Arthur enjoying a quick 20 pence worth in the local inn before galloping off to rescue the obligatory damsel in distress

Dragon Rider from Salamander gives you the unlikely choice of a dragon as your trusty steed The object is to destroy waves of alien worms with a laser lance(?!) or by encouraging your friendly beast to breathe on them Your energy levels can be replenished by allowing the dragon to feed on firestones located at the base of the screen As energy become depleted, the dragon changes colour If it reaches black you have to suffer a less than graceful crash-landing

As well as being original, this game is quite fun to play The only bug I found was in the screen messages which flowed on to the next line If Salamander can correct this they will have an extremely good game on their hands

Quicksilva also produces a very unusual game called *The Wizard* You take the role of a wizard standing on the edge of a lake Before you lie a string of rocks, and on each rock is chained a maiden From out of the sky swoop wave after wave of unpleasant monsters (interspersed occasionally by malevolent ducks!) whose two-fold task is to kidnap the unfortunate girls and to destroy you

You have naturally enough, a magic wand which can be pointed at the enemy At the beginning, they can be destroyed with just one shot, but they increase in strength as you lose your power The graphics are very fine and this is a novel and exciting game

It makes a pleasant change to be able to report that all the games reviewed here are good value Although I found some a little slow or boring, they would doubtless appeal to many people and, by and large, the quality was high I hope more software houses see some of these games and are inspired to think up even more original offerings for the BBC ■

Firm	Program	Price
UK Software 9 King Street Blackpool Lancashire	*Model B Invaders*	£6 95
Bug-Byte 100 The Albany Old Hall Street Liverpool L3 3AB	*City Defence* *Galaxy Wars* *Space Invaders*	£7 50 £7 50 £7 50
Richard Hine	*Bridgeman*	
Salamander 27 Ditchling Rise Brighton East Sussex BN1 4QL	*Dragon Rider*	£7 95
Quicksilva Palmerston Park House 13 Palmerston Road Southampton	*Protector* *Wizard*	£7 95 £6 95
A & F Software 830 Hyde Road Manchester M18 7JD	*Planes*	£8 00

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May 1983	(paper) £5.95

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0 946195 00 5 218pp October 1982 £5.95

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Election night fever!

David Lawrence presents a program for keeping track of the general election results

The origins of this program lie in a request from a producer at my local radio station BBC Radio Solent, to produce a simple cue sheet for use on election night Every local station has access to a mass of electronic information produced by BBC's own election unit, but when it comes to the results in the local area how the swing is going in Hampshire etc it is back to lasting through stacks of paper and hand-written calculations

The object of this program is to allow the results of a specified number of constituencies to be entered and compared with results at the last general election Percentage changes and total votes can then be calculated easily

There is nothing complex in the program itself but a word is in order about the methods of calculation used You will find no calculations in the program about what is known as the swing, though one of the program functions is labelled *Swing Calculations* The reason for this lack is that while the famous Swingometer functions very adequately with a fairly straight two-party situation the calculations are next to impossible if there are likely to be significant changes in the vote of a third party — or at least so says the BBC's election unit and they should know

The most meaningful figures are the changes in each party's percentage of the total vote since the last election The program provides a table of these, on the basis of results announced so far

If you want to calculate the swing from one party to another, then a rough way of doing it is to regard the percentage change for Party A as a swing to or from the party to all the others An approximate idea of how much of that gain or loss may have come from one other specified party can be gained by comparing the percentage changes of the two — noting if any other party's change seems likely to have affected the situation drastically If the third party vote and that of the also rans' don't change much, then the percentage change for each of the two parties you are interested in will represent the classic 'swing

The program analyses the results under four headings Conservative Labour Alliance and Others If you want to extend that, it should present little difficulty

One final word of caution It's no use looking up the figures for the previous election and entering them as the basis for comparison for the simple reason that the boundaries of constituencies have changed since the last election A seat may have the same name but have entirely changed in make up so that any change in percentage vote has nothing to do with actual changes in the way people vote, it is simply that different people are voting

The BBC and ITA have got together to produce an estimate of what the results would have been in the last election If it had been fought under the new boundaries You can probably find a copy in your local library or find extracts for your area in the local paper You will only be able to make meaningful comparisons if you enter the figures from that study for the constituencies you are interested in, even though they are only estimates

To use the program decide how many constituencies you want to deal with, get hold of their hypothetical results from the last election enter them then store on tape and wait for election night to bore all your friends to tears with your electoral wisdom!

Table of variables

CC	The number of constituencies you care to use
S(4,2)	Used to store parties percentage vote for this time and last.
T$	Used to format a constituency name being input
P$(4 15)	Names of parties.
V(2 CC)	Votes cast in each constituency
C$(CC 20)	Names of constituencies
Q(4)	Temporary storage when inputting votes for a constituency
FLAG	Used to default from subroutine at 3500
PT	Total votes cast at last election in seats announced so far
CT	Current total votes in seats announced so far
T(2,4)	Used to store total votes cast so far for each party

Commentary

1000 1170	A straightforward program menu
1500-1600	This module must be run when the program is first used Running it subsequently will wipe out the data
2000-2090	Constituency names and the votes for each of the four groupings are input for the previous election
2500-2600	Votes for the current election are entered under a specified constituency name
3000-3150	The user can page through the results so far moving either by specifying a number to move (preceded by 4) or by naming a constituency
3500 3570	The total votes cast in the announced constituencies for the last election and for this are calculated The test of whether a constituency has not been announced is if the Conservative vote is zero
4000-4490	The percentage changes in each party's vote for the constituencies announced is calculated Part of the previous module is used with execution returning to this module when FLAG is set to 1

```
   1 GO TO 3
   2 SAVE  ELECTION": BEEP 5,20
 VERIFY 'ELECTION"· STOP
1000 REM ************************
1010 REM MENU
1020 REM ************************
1030 CLS   PRINT INK 4,AT 1,12,"
[illegible]"
1040 PRINT INK 0,'"1) INPUT PREV
IOUS RESULTS"
1050 PRINT '2) INPUT NEW RESULTS
'
1060 PRINT "3) DISPLAY TOTAL VOT
E"
1070 PRINT "4) DISPLAY RESULTS"
1075 PRINT "5) CALCULATE SWINGS"
1080 PRINT "6) INITIALISE"
1090 PRINT "7) STOP"
1140 INPUT "WHICH DO YOU REQUIRE
",Z

1530 LET CC=20  DIM S(4,2). DIM
T$(20)  DIM P$(4,15)  DIM V(0,CC
,4)  DIM C$(CC,20)  DIM Q(4)
1540 LET P$(1)="CONSERVATIVE"  L
ET P$(2)='LABOUR"  LET P$(3)="AL
LIANCE"  LET P$(4)="OTHERS"
1600 GO TO 1000

2000 REM ************************
2010 REM INPUT PREVIOUS VOTES
2020 REM ************************
2030 CLS   INK 4  PRINT AT 1,10,
"[illegible]"
2040 INK 1  FOR I=1 TO CC
2045 PRINT '"CONSTITUENCY (",I,"
)",  INPUT O$  PRINT O$
2050 FOR J=1 TO 4  PRINT "VOTES
FOR ",P$(J),  INPUT Q(J)  PRINT
Q(J)  NEXT J
2060 INPUT "ARE THESE CORRECT (Y

O$<>"Y" THEN RETURN
```

continued on page 18

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```
2540 FOR I=1 TO CC: IF T$(1 TO )
=C$(I) THEN GO TO 2562
2560 NEXT I: PRINT '"CONSTITUENC
Y NOT KNOWN.": PAUSE 0: RETURN
2562 FOR J=1 TO 4: PRINT 'VOTES
FOR ",P$(J),: INPUT O(J): PRINT
O(J): NEXT J
2570 INPUT "ARE THESE CORRECT (Y
/N) ",R$
2580 IF R$<>"Y" THEN GO TO 2535
2590 FOR J=1 TO 4: LET V(0,I,J)=
O(J): NEXT J
2620 RETURN

3000 REM ************************
3010 REM RESULTS SO FAR
3020 REM ************************
3030 LET PP=1: CLS : PRINT INK 4
,AT 1,10,"
3036 IF PP>CC THEN LET PP=CC
3037 IF PP<1 THEN LET PP=1
3040 PRINT '"CONSTITUENCY (",PP,
") ",C$(PP)
3060 FOR I=1 TO 4: PRINT P$(I),"
 (",V(1,PP,I);")",TAB 02;V(2,PP,
I): NEXT I
3100 PRINT INK 6,"
                               "
3110 INPUT "ZZZ=QUIT  # NUMBER M
OVES POINTER  CONSTITUENCY NAME"
,O$
3120 IF O$="" THEN GO TO 3110
3125 IF O$="ZZZ" THEN RETURN
3130 IF O$(1)="#" AND LEN O$>1 T
HEN LET PP=PP+VAL O$(2 TO ): GO
TO 3036
3140 LET T$(1 TO )=O$: FOR I=1 T
O 20: IF T$=C$(I) THEN LET PP=I
: GO TO 3060
3160 NEXT I: PRINT INK 2,"CONSTI
TUENCY NOT KNOWN": PAUSE 0: RETU
RN

3500 REM ************************
3510 REM OBTAIN TOTALS
3520 REM ************************
3530 LET FLAG=0: DIM T(2,4): CLS
: PRINT INK 4,AT 1,10,"
"
3540 FOR I=1 TO CC: IF V(2,I,1)<
>0 THEN FOR J=1 TO 4: LET T(1,J)
=T(1,J)+V(1,I,J): LET T(2,J)=T(2
,J)+V(2,I,J): NEXT J
3550 NEXT I: IF FLAG=1 THEN RETU
RN
3560 FOR I=1 TO 4: PRINT P$(I),"
 ", INVERSE 1,T(1,I), INVERSE 0,
TAB 27,T(2,I): NEXT I
3570 PRINT '"PRESS ANY KEY TO QU
IT": PAUSE 0: RETURN

4000 REM ************************
4010 REM SWING CALCULATION
4020 REM ************************
4030 CLS : PRINT INK 4,AT 2,12,"
SWINGS"
4035 LET FLAG=1: GO SUB 3540: LE
T FLAG=0
4300 LET PT=0: LET CT=0: FOR I=1
 TO 4: LET PT=PT+T(1,I): LET CT=
CT+T(2,I): NEXT I
4410 FOR I=1 TO 4: LET S(I,1)=IN
T (T(1,I)/PT*10000+.005)/100: LE
T S(I,2)=INT (T(2,I)/CT*10000+.0
05)/100: NEXT I
4420 FOR I=1 TO 4: PRINT INK I,P
$(I)'"PREVIOUS % ",S(I,1)'"CURRE
NT  % ",S(I,2)'"CHANGE     ",INT
 (100*(S(I,2)-S(I,1))+.005)/100
4430 PRINT INK 0,"
                  ": NEXT I
4450 PRINT '"PRESS ANY KEY TO QUI
T": PAUSE 0
4460 RETURN
```

The Pit - part three

***Paul Sellin** presents the final part of* The Pit *– a text adventure for the 16K Spectrum*

This week we shall finish the program by looking at the remaining sections. Nearly all these blocks of program, and also the monster section covered last week, are accessed from a section of the main loop which determines the player's position and then works out what he has found.

This section occurs in lines 1020 to 1616. Line 1020 assigns *z$* the character which it finds at the player's position in the array, and then *Restores* to 1500 plus the ASCII code of the character. Two variables are then read from the data statement at that line.

This means that the data for a monster must be put on line 1500 plus the code for *m*, or 1609. The two pieces of data at each line are a string which is either a small title or a blank (an *x*) and the line to which the program will jump. These are assigned to *o$* and *e* respectively.

The first two sections to look at are for finding 'loot' (*Data* on line 1596) and 'flares' (*Data* on line 1602). The 'loot' routine is at line 2400 and just creates a random amount of loot between one and 30 and adds it to the loot variable *l*. The 'flare' routine is located at line 2900 and also creates a random number of flares between one and nine.

Incidentally, don't confuse this 'finding flares' routine with the 'using a flare' routine at line 2705 onwards. Notice that both the flares and the loot sections make the corresponding position in the main array a blank and then return to the main loop via the status report at line 8000.

Next is the gem routine which comes into action when the player finds treasure. The *Data* is at line 1542 while the routine itself runs from line 2010 to 2030. Line 2010 *Restores* the data pointer to line 2030 and then loops a random number of times. *Reading p$*.

The *Data* contains the name of the gem, plus a number at the end. This number ranges from between one and five and records the value of the gem. But, the player never sees this, so whenever the string is printed the last character is omitted.

Lines 2013 and 2015 allow the player to drop his current gem and keep the new one if he already has his hands full and

```
3050 IF i<10 THEN PRINT '"No tho
ught is available to you"'. PRIN
T   GO TO 3025
3060 LET f=INT (RND*9). LET g=IN
T (RND*9): PRINT "You ask. ",f,"
*",g,"...". PAUSE 100. LET h=f*g
+INT (RND*(21-in)/10)+INT (RND*(
21-in)/10)  IF in=0 THEN PRINT '
"Monster doesn't understand, and
 prepares to attack...". GO TO 3
025
3070 PRINT "Monster reckons: ",f
;"*",g;"=";h  IF h=f*g THEN PRIN
T '"It's right..."  LET i=i-INT
(in/2). GO TO 3025
3075 PRINT "It's wrong!!". PAUSE
 100. LET p=p-INT (pa/4)  LET i=
i+INT (in/4)  GO TO 3040
3100 DATA "an evil Wrath",15,20,
5,5,"a mad magician",10,20,0,15,
"the Black King",10,20,15,15,"a
Gorlak",5,5,5,5,"the Black Queen
",10,20,5,20,"the Warlord",20,20
,20,5,"a stupid Warg".15.1,10,0.
"the Great Dragon",15,20,5,15
3500 BEEP .1,5: BEEP .1,12: BEEP
 .1,15  PRINT "So you want to tr
ade...". IF l<50 THEN PRINT '"Bu
t you're too poor too trade..."'
'"He curses you and vanishes int
o the mists of time...": BEEP .5
,0  LET a$(z,y,x)="a"  GO TO 100
0
3507 IF y$=" " THEN PRINT '"But
you haven't anything to     trad
e with!"'  GO TO 1000
3510 LET e=INT (25+RND*100*VAL y
$(LEN y$ TO ))  PRINT "Trade wit
h or ignore him?": PAUSE 1. PAUS
E 0. IF INKEY$="i" THEN PRINT '
"OK.". GO TO 8000
3520 BEEP .1,24. PRINT "Do you w
ant to sell "'y$( TO LEN y$-1),"
 for ",e," pieces of loot?". PAU
SE 1  PAUSE 0  IF INKEY$="y" THE
N LET l=l+e. PRINT "You now have
 ";l," pieces of loot". LET y$="
 "  GO TO 8000
3525 PRINT '"O.K.". GO TO 8000
8000 BEEP .1,0  BEEP .1,8. BEEP
.1,8  POKE 23692,255  PRINT PAPE
R 5,'"***Status Report***", PAPE
```

then assigns the temporary *p$* to the player's *y$* which is the string used to show treasure being carried. Leaving the routine is again through the status report at line 9000, which prints out any treasure being carried.

The cupboard routine at lines 2500 to 2560 is similar to the gem routine, as can be seen from the *Data* in line 2530. Line 2505 requires key o (for 'open') to be pressed, otherwise the routine is exited to line 1000.

Lines 2515 to 2520 allow the player to add bonus points, if he finds 'a set of bonuses'. Any other finds are dealt with in lines 2540 to 2560, where the program branches out depending on the first two characters of the *Data* (*x$*). Notice the different ways each line leaves the routine, though they all end up back at line 1000.

When enough loot has been collected and some treasure found, it can be sold to a trader for more loot. The *Data* for this routine is at line 1616 and the program jumps to line 3500. This line just checks whether *1* is large enough — if not, it creates a monster and returns to the main loop.

The routine is quite straightforward, line 3510 works out the selling price for the treasure based on its value, which is obtained from the end character of *y$*. The player can then accept the price and sell his treasure (line 3520), or hang on to it in the hope of getting a better price (line 3525). In fact, the best tactic when playing is to repeatedly refuse to sell and move in and out of that room until a very high price is offered — luckily the traders are extremely patient!

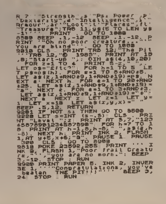
Since the size of the memory does not allow staircases in the game, the only way of moving between levels is through a 'Time Warp'. The array character for this is a '?'. The *Data* in line 1536 directs the program to the routine in line 2800. This just assigns random values within the required ranges to the variables *z*, *x* and *y*, so repositioning the play. It returns to the loop via the status report.

The final, and in some ways the most important, routine is that of the Teleport. This is a 'secret' feature of the program in that it has to be specifically asked for by pressing key *t* (line 1005) and only works when the player possesses the Rune Staff. The routine is at lines 2200 to 2215 and allows the player to jump anywhere he choses. Line 2210 just checks that it isn't an illegal move.

That, briefly, is the entire program. Bear in mind if adding to it, or writing your own, that an adventure game is made interesting by including hidden extras which create a feeling of there always being more to discover in the program.

A lot of memory is obviously very useful to make the games long and complex, but you can see how much can be squeezed into only the 9K available on the smaller Spectrum. So happy adventuring to you all and remember — watch out for a Warlord and don't be too hard on a stupid Warg.

The Pit has been split into three parts. Enter part 3 of the program now and *Save* it on tape. Next, *Load* all three parts of the program into the Spectrum and *Run* it.



```
R 7 '"Strength",s'"Ps: Power",P'
"Dexterity",d'"Intelligence",i'"
Armour",ar'"Loot";l'"Flares",fl'
"Treasure";TAB 11,y$(5 TO LEN y$
-1)''' PRINT . GO TO 1000
8500 BEEP .1,-12 BEEP .1,-12. P
RINT '"Oh no poor creature..."'"
You are blind"'' . GO TO 1000
9010 CLS  PRINT TAB 12;"The Pit
"''TAB 12,"© 1983". PRINT AT 10
,8;"Start-up ";: DIM a$(4,10,20)
 FOR z=1 TO 4  PRINT 5-z," ",
LET o$="£ftc?"  FOR h=1 TO 5  LE
T p$=o$(h). FOR e=1 TO 8+RND*5.
LET a$(z,1+RND*9,1+RND*19)=p$. N
EXT e  NEXT h  FOR e=1 TO 20+RND
*25. LET a$(z,1+RND*9,1+RND*19)=
"a". NEXT e. FOR e=1 TO 3+RND*3.
 LET a$(z,1+RND*8,1+RND*19)="$":
 NEXT e  NEXT z  LET z=1  LET y=
1  LET x=10  LET a$(z,y,x)=" "
BEEP .5,12. RETURN
9201 IF NOT s: THEN GO TO 8500
9220 LET s=INT (s-.5)  CLS . PRI
NT "Level ";z  PRINT AT 5,7,"123
45678901234567890"  FOR h=7 TO 1
6  PRINT AT h-1,5,h-6," ",a$(z,h
-6). NEXT h. PRINT INK 2, FLASH
1,AT y+5,x+6;"a". PAUSE 1  PAUSE
 300  CLS . GO TO 8900
9810 POKE 23592,255  PRINT ''' I
NK 2, FLASH 1,"Poor frail Creatu
re,"'',"you are no more.": BEEP
3,-12. STOP : RUN
9900 PRINT PAPER 6. INK 2, INVER
SE 1,'''"Congratulations, you've
 beaten  THE PIT!!!"''' BEEP 3,
24  STOP . RUN
```

A question of character

***Peter Chase** explains how to create and print user-defined graphics on the Dragon*

This article is designed to show you how to create user-defined graphics for the Dragon and how a defined set of text characters can be printed whenever you like with hi-res graphics, using a fast and easy-to-use routine

First the user-defined characters. Type in lines 10-230 of Listing One which will allow you to define a character set and place it in an area of Ram When you Run this part of the program you will be asked which character you wish to define — say the letter *A*. Enter this and then draw it on the 8 X 8 board as instructed, using arrow keys to move *Enter* to draw *Clear* to erase and *Space* to finish the characters (see Figure 1)

Obviously you will eventually want all the letters upper and lower case numbers and punctuation marks but at first define just the upper case letters and a space so that you can test the rest of the program If you like, you can also define some useful graphics symbols (eg snappers, invaders, etc see Figure 1), by typing numbers from 128 to 255 in response to *Character ?* and defining them as usual Keep a note of the numbers you have used for these graphics symbols, so you can use them in your programs When you have completed your characters *Break* out of the program

To print these defined characters, type in lines 500 to the end of listing one (listing Two is the assembly language version of lines 500-600) Before doing anything else *Save* your program in case you have made a mistake typing in the Hex codes Also, *Save* your defined characters with the command *Csavem "UDG" &H7000, &H77FF, &H7FF* Now type *Goto 500* and, when the first part has finished, *Goto 1000*, which should give you a demonstration of the characters you have typed in

In addition, the routine gives 23 lines of 32 characters instead of the usual 16 lines It also includes an automatic smooth scroll, which happens whenever the *Y* co-ordinate reaches 24 If you fail to get this demonstration, turn the computer off *Load* your Basic program back in and your character set with *Cloadm*, correct your errors and enter *Goto 500* and *Goto 1000* Once the demonstration is working, you can Run the entire program to alter and extend your character set

When you are happy with your character set, *Save* the machine-code printing routine and your character set using *Csavem "Udgprint", &H7000 &H7880 &H880* You now have a routine which can be loaded at any time to print text and UDG symbols together with your hi-res graphics

The routine is used in a similar way to print At the start of your program write *10 Cloadm Clear 100, &H6FFF Defusr0 = &H7800* Then every time you wish to print something use

```
A$ = "what you wish to print" + CHR$(13)
                                  (can be a variable)
POKE&H7FF1,y coordinate                    (0 to 23)
POKE &H7FF1 Y COORDINATE                   (0 to 23)
N = USR0(VARPTR(A$))
```

Fig 1

```
Listing One-Character Definer

10 PCLEAR5:PMODE0,5:PCLS:SCREEN0,0
20 CLEAR 1000,&H6FFF
30 DIMA(8,8)
40 CLS0:PRINT@448,"";:LINEINPUT"CHARACTE
R?";C$:IFVAL(C$)<10THENC=ASC(C$)ELSEC=VAL(C$)
50 FORI=1TO8:FORJ=1TO8:A(I,J)=0:NEXTJ,I
60 X=1:Y=1
70 FORI=1TO8:FORJ=1TO8:PRINT@J*32,CHR$(1
28-79*(A(I,J)<>0));:NEXTJ,I
80 P=X+Y*32+1024:PE=PEEK(P):PF=255:K$=INKEY$
90 PRINT@1,"12345678";:PRINT@32+257,"12345678";
100 PRINT@16,"ENTER TO SET":PRINT@48,"CL
EAR TO RESET":PRINT@80,"SPACE TO STOP":P
RINT@112,"ARROWS TO MOVE"
110 POKEP,PE:FORI=1TO10:NEXT:IFPEEK(135)
<>0THEN120ELSEPOKEP,PF:FORI=1TO10:NEXT:GOTO110
120 IF PEEK(135)=10ANDY<>8THENY=Y+1:GOTO 80
130 IF PEEK(135)=8ANDX<>1THENX=X-1:GOTO80
140 IF PEEK(135)=9ANDX<>8THENX=X+1:GOTO80
150 IF PEEK(135)=13THENZ=1:GOTO 200
160 IF PEEK(135)=12THENZ=0:GOTO 200
170 IF PEEK(135)=32THEN210
180 IFY<>1THENY=Y-1
190 GOTO80
200 A(Y,X)=Z:PRINT@X+Y*32,CHR$(128+79*Z)
;:GOTO80
210 REM PUT CHARCTER IN RAM
220 FORI=1TO8:N=0:FORJ=1TO8:N=N+A(I,J)*(
2^(8-J)):NEXT:POKE&H6FFF+C*8+I,N:NEXT
230 GOTO40

500 REM LOAD MACHINE CODE
510 I=&H77FF:REM START-1
520 I=I+1
530 READ A$
540 IF A$="Z" THEN STOP
550 POKEI,VAL("&H"+A$)
560 GOTO520
570 REM PROGRAM IN HEX
580 DATA 1F,21,FC,7F,F0,34,06,A6,80,81,0
D,26,03,35,06,39,C6,08,3D,C3,70,00,1F,02
,35,06,BD,78,2E,4C,81,20,25,E3
590 DATA 4F,5C,C1,18,25,DD,5A,BD,78,4B,2
0,D7,34,36,8E,06,00,30,88,30,89,01,00,5A
,26,F9,C6,08,A6,A0,A7,84,30,88,20,5A,26,
F8,35,36
600 DATA 39,34,36,C6,00,34,04,BD,78,5C,3
5,04,5A,26,F8,35,36,39,CC,0C,00,10,8E,06
,00,CE,06,20,AE,C1,AF,A1,5A,26,F9,4A,26,
F8,39,Z
1000 REM TEST
1010 REM
1020 PMODE4,1:PCLS:SCREEN1,1
1030 DEFUSR0=&H7800
1040 READA$:IFA$<>"ZZ"THENA$=A$+"
                          "+CHR$(13):POKE&
H7FF0,0:POKE&H7FF1,23:N=USR0(VARPTR(A$))
:GOTO1040
1050 DATA ABCDEFGHIJKLMNOPQRSTUVWXYZ,THI
S IS A TEST,KLKLKLK,IF A THEN GOTO,RETUR
N,PUT ANYTHING HERE,A,B,C,D,E,F,G,H,J,I,
K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z
1060 DATAZZ
1070 GOTO1070
```

Continued on page 24



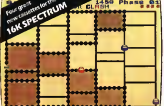
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Listing Two-Hires Printing

```
7000                 ORG   $7000
7000         @START  EQU   *
7000 1F21            TFR   Y,X
7002 FC7FF0          LDD   $7FF0
7005 3406    @PR     PSHS  D
7007 A6A0            LDA   ,Y+
7009 810D            CMPA  #13
700B 2705            BEQ   @NCR
700D 3506            PULS  D
700F 39              RTS
7010 C600    @NCR    LDB   #0
7012 3A              ABX
7013 C37000          ADDD  #$7000
7016 1F02            TFR   D,Y
7018 3506            PULS  D
701A BD702E          JSR   @PRTCHR
701D 4C              INCA
701E 8120            CMPA  #32
7020 25E3            BLO   @PR
7022 4F              CLRA
7023 5C              INCB
7024 C118            CMPB  #24
7026 25DD            BLO   @PR
7028 5A              DECB
7029 BD704B          JSR   @BUSEC
702C 20D7            BRA   @PR
702E 3436    @PRTCHR PSHS  D,X,Y
7030 8E0600          LDX   #1536
7033 308B            LEAX  D,X
7035 30890100 @ADDL  LEAX  256,X
7039 5A              DECB
703A 26F9            BNE   @ADDL
703C C608            LDB   #8
703E A6A0    @PRI    LDA   ,Y+
7040 A784            STA   ,X
7042 308820          LEAX  32,X
7045 5A              DECB
7046 26F6            BNE   @PRI
7048 3536            PULS  D,X,Y
704A 39              RTS
704B 3436    @BUSEC  PSHS  D,X,Y
704D C608            LDB   #8
704F 3404    @LL     PSHS  B
7051 BD705C          JSR   @SCROLL
7054 3504            PULS  B
7056 5A              DECB
7057 26F6            BNE   @LL
7059 3536            PULS  D,X,Y
705B 39              RTS
705C CC0C00  @SCROLL LDD   #1536+1600
705F 10CE0600        LDY   #1536
7063 CE0620          LDU   #1536+32
7066 AEC1    @P1     LDX   ,U++
7068 AFA1            STX   ,Y++
706A 5A              DECB
706B 26F9            BNE   @P1
706D 4A              DECA
706E 26F6            BNE   @P1
7070 39              RTS
7071                 END   @START
```



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Overall majority . . .

***Boris Allan** presents an election night special for all voters*

This Election Night program is designed to help you keep track of election results on the night of June 9

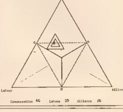
The idea is to put the results in as they are announced and the display — on screen — will help you to comprehend what possibilities there are for the three major parties, given the current state of seats. Can party *X* possibly be the largest party when is it certain that party *Y* cannot have an overall majority, and — at the end — how are the minor parties placed, are they in a position of power, do they hold the balance?

Now there are three major parties, the use of two-dimensional gadgets such as the swingometer is confusing. However with three main parties it is possible to give a two-dimensional representation of their relative status, an equilateral triangle.

If you examine the diagram, the triangle and its interpretation are fairly self-explanatory. Each apex stands for 100 percent of seats going to that party directly opposite on the side facing is 0 percent of seats going for that party. Where the three axes of symmetry meet (at the centre of the triangle) all the parties have the same number of seats.

The sector between the dotted line and the apex represents an overall majority for that party, the smaller sector between the dotted line and the centre shows that that party is the largest but without an overall majority.

When the results come in the present state of the parties might be party *X* 10 percent, party *Y* 20 percent, and party *Z* 25 percent. If we draw a triangle to represent these figures, we can see that the corner of the triangle is almost out of party *X*'s overall control sector, but the other two parties can still be the largest party, and have an overall majority (see diagram). It is also clear that the balance is in favour of party *Z*, but only slightly.

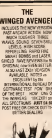


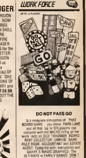
The program only works for the coming election, and cannot be used for polls, but it can be modified. The design is modular, and the simplest version can be run by merely typing in *Procgo*. This procedure uses other procedures which draw triangles, quadrilaterals, and similar these other procedures can be used as a basis for your own elaborations. The program is designed to run in mode 1, but the *Proctext* procedure can easily be changed (with less resolution) to run under mode 5.

The routines are purely descriptive and not at all predictive, but give a feel for the state of play. ■

```
LLIANCE?
Escape at line 1460
>LIST
 1000REM
 1010REM THE STATE OF THE COMMONS
 1020REM
 1030REM (c) BORIS ALLAN, 1983
 1040REM
 1050REM
 1060
 1070DEF PROCTEXT
 1080COLOUR 128:COLOUR2
 1090VDU 28,0,31,31,25
 1100ENDPROC
 1110
 1120DEF PROCGRAF
 1130VDU 24,0;239;1279;1023;
 1140VDU 29,639;300;
 1150ENDPROC
 1160
 1170DEFPROCTRI(COL,X1,Y1,X2,Y2,X3,Y3)
 1180GCOL0,COL
 1190PLOT4,X1,Y1:PLOT5,X2,Y2:PLOT85,X3,Y3
 1200ENDPROC
 1210
 1220DEF PROCCOL
 1230VDU19,3,4,0,0,0
 1240CLG
 1250ENDPROC
 1260
 1270DEF PROCQUAD(COL,X1,Y1,X2,Y2,X3,Y3,X4,Y4)
 1280GCOL0,COL
 1290PLOT4,X1,Y1:PLOT5,X2,Y2:PLOT85,X3,Y3:PLOT
5,X4,Y4:PLOT85,X1,Y1
 1300ENDPROC
 1310
 1320DEF PROCSHADE
 1330GCOL0,0:PLOT4,0,0:PLOT21,X/2,300:PLOT21,
-X/2,300:PLOT21,0,0
 1340ENDPROC
 1350
 1360DEF PROCSET
 1370PROCTEXT:CLS:PROCGRAF:CLG
 1380X=600/TAN(RAD(60))
 1390PROCQUAD(3,0,200,X/2,300,0,600,-X/2,300)
 1400PROCQUAD(1,0,200,-X/2,300,-X,0,0,0)
 1410PROCQUAD(2,0,200,0,0,X,0,X/2,300)
 1420PROCSHADE
 1430ENDPROC
 1440
 1450DEF PROCIN
 1460INPUT"ALLIANCE",A:A=A/650
 1470INPUT"CONSERVATIVE",C:C=C/650
 1480INPUT"LABOUR",L:L=L/650
 1490ENDPROC
 1500
 1510DEF PROCCOORD
 1520X=600*TAN(RAD(30))
 1530Y1=600*C:Y3=Y1:Y2=600*(1-A-L)
 1540AV=2*X*A:LV=2*X*L
 1550X1=-X*(1-C)+AV:X2=(AV-LV)/2:X3=X*(1-C)-LV
 1560ENDPROC
 1570
 1580DEF PROCGO
 1590CLS
 1600PROCSET:PROCIN:PROCCOORD:PROCTRI(0,X1,
Y1,X2,Y2,X3,Y3)
 1610ENDPROC
>*.
```







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Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published

Psephologiser

on Lynx

This is a program designed to turn you into the poor man's Robin Day

The program started life as a ZX81 version, written to analyse the County Council election results of 1982 but is completely re-written here to make use of the vastly superior graphics of the Lynx (not to mention the colour) Although the program is straightforward enough it is capable of handling the results of the entire next General Election (if your fingers and your brain can stand it!)

Inputting each candidate's votes it is possible to tell how well a Party is doing in a particular seat, district, city, entire region or even the UK as a whole

The screen displays the votes of each Party in a seat, its share of the vote in that seat its total vote of all seats inputted so far and its share of the total vote so far

A typical screen

	Total in this seat = 32,965		Total vote so far = 236 829	
Con	15 431	46 7%	108 063	45 6%
Lab	13 892	42 1%	96 941	41 7%
All	3 464	10 4%	23 508	9 9%
Oth	228	0 6%	6 317	2.6%

PRESS X TO CONTINUE

Program notes

Lines	
10 70	Initialises the variables, sets up an array to hold the Parties names
80-200	Prints out the name of a Party waits for you to input the votes for that Party in that seat prints the votes next to the Party's name on the screen Repeats this for all four
210-510	Prints out each Party's total in that particular seat its percentage poll in that seat, its total votes received so far and its overall percentage poll All displays in the Party's colours the same information in bargraph form
520-550	Creates a pause to read the figures Press key X will clear the screen and go to line 80 to input another set of votes for another seat.

Variables

D =	Total votes of all Parties for all votes inputted so far
Z =	Total votes of all Parties in the seat being looked at
X =	Votes of a particular Party in the seat being looked at
V =	Total votes for an Individual Party in all the seats inputted so far
M =	Percentage of a Party in all seats so far inputted
L =	Percentage of a Party in the seat being looked at

The use of *Text* in line 90 disables the *Blue* and *Red* memory banks in the Lynx and makes the printing faster Line 300 switches back on all the memory banks to allow the bargraphs to be printed in colour

The program is easily adapted to allow for variations There is room to add additional Parties (eg the Flat Earth Society or the Ban Clive Sinclair Party) For five Parties for instance just change lines 30 to 70 to be for five variables instead of four Also add a further name to the string at line 20 (eg line 20 might now read *Let a$* = "CON LAB ALL OTH SDP")

```
10 LET D = 0
20 LET A$ = "CON LAB.ALL.OTH"
30 DIM L(4)
40 DIM M(4)
50 DIM X(4)
60 DIM V(4)
70 LET V(1) = 0 V(2) = 0 V(3) = 0, V(4) = 0
80 LET Z = 0 R = 1
90 TEXT
100 VDU 24 4
110 FOR N = 1 TO 4
120 PRINT @ 20 N * 10 MID$ (A$ R 4)
130 INPUT X(N)
140 PRINT @ 32, N * 10      X(N)
150 LET Z = Z + X(N)
160 LET Q   Q + X(N)
170 LET V(N) = V(N) + X(N)
180 LET R = R + 4
190 NEXTN
200 PAUSE 20000
210 VDU25 4
220 PRINT @ 8 10  TOTAL IN THIS  @ 8 20
    SEAT =  Z @ 70 10  TOTAL VOTES SO"
    @ 70 20  FAR =  Q
230 LET R = 1
240 FOR N = 1 TO 4
250 LET L(N) = INT (X(N) * 1000/Z)/10
260 LET M(N) = INT (V(N) * 1000 Q)/10
270 PRINT @ 0 R * 4 + 40 MID$(A$ R,4)     ,X(N)
    TAB15 L(N)  %  TAB25 V(N)
    TAB35 M(N)  %
280 LET R = R + 4
290 NEXT N
300 PROTECT 0
310 VDU 1 7
320 MOVE 25 200
330 DRAW 110 200
340 MOVE 140 200
350 DRAW 233,200
360 FOR N = 1 TO 4
370 READ A
380 READ B
390 INK A
400 MOVE B,205
410 FOR X = 205 TO 305 - L(N) STEP - 1
420 DRAW B + 23 X
430 MOVE B + 1,X - 1
440 NEXT X
450 MOVE B + 115,205
460 FOR X = 305 TO 205 - M(N) STEP - 1
470 DRAW B + 130 X
480 MOVE B + 116,X  1
490 NEXT X
500 NEXT N
510 PRINT @ 30 230  PRESS X TO CONTINUE
520 IF KEYN = 88 THEN GOTO 540
530 GOTO 520
540 RESTORE
550 GOTO 80
560 DATA 1 30 2,50 6 70 4 90
```

Psephologiser
by M Dicks

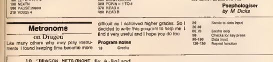
Metronome

on Dragon

Like many others who may play instruments I found keeping time became more difficult as I achieved higher grades So I decided to write this program to help me I find it very useful and I hope you do too

Program notes

10	Credits
20	Sends to data input
30 40	
30,70	Sound loop
50	Checks for key press
80-120	Data input
130-150	Repeat function



```
10 'DRAGON METRONOME By A.Roland
20 GOSUB90
30 'SOUND LOOP
40 SOUND10,1
50 A$=INKEY$:IFA$="S"THEN130
60 FORK=1TO A:NEXT
70 GOTO40
80 'DATA INPUT
90 CLS
100 INPUT"ENTER NUMBER FOR LENGTH OF DELAY      (500=AVERAGE SPEED)";A
110 PRINT@73,"PRESS 'S' TO END"
120 RETURN
130 CLS
140 INPUT"DO YOU WANT TO USE THE METRONOME AGAIN(Y/N)";A$
150 IFA$="Y"THEN20ELSEEND
```

Metronome
by A Roland



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SOFTWARE FOR DRAGON 32

HI-RES High Resolution Display for DRAGON 32

Supplied on Cartridge, for DRAGON 32 price £25.30

HI-RES gives you a 51 column by 24 line display instead of the 32 column by 16 line display on your DRAGON 32 computer. If that was all it would be quite something, but in addition HI-RES has the following features.

- HI-RES does not eliminate BASIC
- Upper and lower case as standard
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- Extra BASIC commands for screen control
- About 16 [illegible] bytes available for BASIC programs
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- Return to standard display mode at any time
- Graphics and text can be mixed on the screen

We firmly believe that HI-RES is the most useful and powerful software tool you have [illegible] for your DRAGON 32 computer.
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HI-RES allows Sprite graphics which are not available on a standard DRAGON 32. If the entire character set is used then over two hundred sprites can be [illegible] in a single program! The BASIC graphics functions work directly on the HI RES screen allowing you to mix text and drawings. HI-RES allows two colours, green and white, in both normal (black on colour) and inverted (colour on [illegible]) mode.

What extra commands do I get?
HI-RES implements [illegible] PRINT statements to [illegible] normal and sprite printing on its own screen. Extra functions (about twenty) have been added to the CLS command. These allow you to change character sets, switch the cursor on and off, underline and more.

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4-D Resurrection

on Spectrum

In this game you are a time traveller with the task of voyaging back in time to save people who are dying. To do this you use a time receiver which you lock on to your subject at the time and place of his death. However, you have to align the four dimensional receiver to effect transfer. This is done by pressing keys 1-2 3-4, 7-8 and 9-0 to align the four dimensions. This is not as easy as it sounds and random time vortices are changing continuously. Your score starts at 1,000 and falls.

You have to affect transfer in the shortest possible time to get a high score. This requires an agility in all eight fingers and the game is one that exercises co-ordination.

Program notes

Lines

5-99	Instructions and initialisation
100-400	The main loop
500-580	The end sequence
9000 up	Subroutines as follows:
9000-9130	Define special graphics
9200-9640	Print the screen display
9900-9530	Print the markers

When entering the program, line 105 has its first *Rem* removed, and this has the effect of removing the time vortices. Thus one can align the four points easily and see that the rest of the program works.

A lot of the program is involved with producing patterns and generally making an interesting display. As with all target and reaction games, if written in terms of just aligning numbers it could be done in about 10 lines but then it wouldn't be very interesting! The *Rem* line 9130 shows which graphic is which once they are defined. Of course, the letters in lines 9250 to 9207 refer to the special graphics.

A more detailed description follows. The markers are moved at random in lines 110 to 136. Originally every point was moved each cycle. However, this made the program far too slow. Therefore one point is picked at random and moved each cycle. If you think this makes it sound easy, then just try and play it! The remaining lines of the main loop involve user moves. They are lengthy in order to error trap.

The initial display is set up by defining special characters to make out the graticle and then printing this in. A design is drawn from a font of eight selected at random in the centre of the screen. After play another pattern is drawn, based on the final position of the pieces, although you are unlikely to see any correlation. There is simple score accumulation.

```
  5 INK 7: BORDER 1: PAPER 1
  6 PRINT "TIME RESCUE"''"(c) RTL 1983": PRINT : PRINT
  7 REM This program is on the Porthtowan combo tape issue 2. Price £4 from RTL, Westman ,Porthtowan, Truro, Cornwall."
  8 PRINT  BRIGHT 1; PAPER 0;"You are operating a machine that is designed to capture the soul of program + data, from  the brains of people who died in the past.  They are then resurrected to  a  life  of immortality. You have  to align four dimensions by  pressing  the number keys as shown on the display.  Time vortices make this  more  difficult than this sounds. To get  a highscore, alignment must be quick. "
 10 PRINT : PRINT "Press any key to continue"
 12 LET a$=INKEY$: IF a$="" THEN  GO TO 12
 13 LET cs=0: LET ng=0: DIM f(4,2): DIM a(4,2): DIM l(4,2)
 18 CLS : GO SUB 9000
 20 GO SUB 9200
 50 LET s=1000
 95 LET p$="■": GO SUB 9500
 99 REM  main loop
100 PRINT  PAPER 2; BRIGHT 1;AT 4,14;"    ";AT 4,14;s: LET s=s-1
105 REM  GO TO 130: REM ****insert this to test****
110 LET r=1+INT (RND*4)
115 LET a(r,1)=a(r,1)+2-INT (3*RND)
118 IF r=2 OR r=4 THEN  GO TO 130
122 IF a(r,1)<5 THEN  LET a(r,1)=5: GO TO 128
124 IF a(r,1)>26 THEN  LET a(r,1)=26
126 PRINT AT f(r,1),l(r,1);" ": LET l(r,1)=a(r,1): PRINT AT f(r,1),a(r,1); INK 6;"■": GO TO 150
128 IF a(r,1)<5 THEN  LET a(r,1)=5: GO TO 136
132 IF a(r,1)<5 THEN  LET a(r,1)=5: GO TO 136
134 IF a(r,1)>16 THEN  LET a(r,1)=16
136 PRINT AT l(r,1),f(r,1);" ": LET l(r,1)=a(r,1): PRINT AT a(r,1),f(r,1); INK 4;"■": GO TO 150
150 LET i$=INKEY$: IF i$="" THEN  GO TO 200
155 LET i=CODE i$-48: IF i<0 OR i>9 THEN  GO TO 300
160 GO TO 1(i*2+170)
170 LET a(4,2)=a(4,2)+1: IF a(4,2)>16 THEN  LET a(4,2)=16
171 LET f1=4: GO TO 200
172 LET a(1,2)=a(1,2)-1: IF a(1,2)<5 THEN  LET a(1,2)=5
173 LET f1=1: GO TO 200
174 LET a(1,2)=a(1,2)+1: IF a(1,2)>26 THEN  LET a(1,2)=26
175 LET f1=1: GO TO 200
176 LET a(3,2)=a(3,2)-1: IF a(3,2)<5 THEN  LET a(3,2)=5
177 LET f1=3: GO TO 200
178 LET a(3,2)=a(3,2)+1: IF a(3,2)>26 THEN  LET a(3,2)=26
179 LET f1=3: GO TO 200
183 GO TO 300
184 LET a(2,2)=a(2,2)-1: IF a(2,2)<5 THEN  LET a(2,2)=5
185 LET f1=2: GO TO 200
186 LET a(2,2)=a(2,2)+1: IF a(2,2)>16 THEN  LET a(2,2)=16
187 LET f1=2: GO TO 200
188 LET a(4,2)=a(4,2)-1: IF a(4,2)<5 THEN  LET a(4,2)=5
189 LET f1=4: GO TO 200
200 IF f1=1 OR f1=3 THEN  PRINT  INK 5;AT f(f1,2),l(f1,2);" ";AT f(f1,2),a(f1,2);"■": LET l(f1,2)=a(f1,2): GO TO 220
210 PRINT  INK 5;AT l(f1,2),f(f1,2);" ";AT a(f1,2),f(f1,2);"■": LET l(f1,2)=a(f1,2): GO TO 320
300 FOR f=1 TO 4: IF a(f,1)<>a(f,2) THEN  GO TO 320
310 NEXT f: GO TO 500
400 GO TO 100
500 CLS
510 PRINT AT 0,0;"TARGET LOCKED . . ."
511 REM print end pattern
512 FOR f=0 TO PI*2+.1 STEP .1
513 LET r=50*SIN ((a(1,2)-5)*f)*SIN ((a(2,2)-5)*f)*SIN ((a(3,2)-5)*SIN ((a(4,2)-5)*f))
514 LET x=128+r*SIN f: LET y=90+r*COS f
516 IF f=0 THEN  PLOT x,y: GO TO 517
516 DRAW x-PEEK 23677,y-PEEK 23678
517 NEXT f
520 PRINT "REANIMATION COMPLETED"
530 PRINT : PRINT "Your score was ";s
535 LET ng=ng+1: LET cs=cs+s
540 PRINT "Your cumulative score is ";cs;" in ";ng;" go";
542 IF ng>1 THEN  PRINT "es";
544 PRINT "."
560 PRINT #1; PAPER 6; INK 2;"Press s to end, any other key to continue."
570 IF INKEY$="" THEN  GO TO 570
580 IF INKEY$="s" THEN : STOP
8900 GO TO 18
9000 REM subroutines
9090 REM define special graphics
9100 RESTORE 9120: FOR f=USR "a" TO USR "f"+7
9110 READ ff: POKE f,ff: NEXT f: RETURN
9120 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,255,0,0,0,0,0,0,0,1,4,8,0,0,0,0,0,192,48,0,0,0,0,0,0,1,0,0,0,0,0,0,48,192,0,0,0
9130 REM aAbBcCdDeEfF
9199 REM Print main screen
9200 REMSTORE 9240: FOR g=0 TO 3: FOR f=0 TO 3
9210 READ f1,f2
9220 PRINT AT f1,f2;CHR$ (144+g)
9230 NEXT f: NEXT g
9240 DATA 0,4,4,0,18,4,4,28,0,27,4,3,4,31,18,27,3,4,17,0,21,4,17,28,3,27,17,3,21,27,17,31
9250 FOR f=0 TO 16: PRINT AT f,0;"A";AT f,3;"A";AT f,28;"A";AT f,31;"A": NEXT f
9260 FOR f=1 TO 2: PRINT AT f,4;"A";AT f,27;"A";AT f+18,4;"A";AT f+18,27;"A": NEXT f
9270 LET f$="": FOR f=0 TO 20: LET f$=f$+"B": NEXT f: PRINT AT 0,5;f$;AT 3,5;f$; AT 18,5;f$;AT 21,5;f$
9280 LET f$=f$(1 TO 2): PRINT AT 4,1;f$;AT 17,1;f$;AT 4,29;f$;AT 17,29;f$
9290 RESTORE 9300: FOR f=0 TO 7: READ f1,f2,f3: PRINT INVERSE 1;AT f1,f2;f3: NEXT f
9300 DATA 1,3,1,1,28,2,20,3,3,20,28,4,3,1,7,3,30,8,18,1,8,18,30,0
9310 REM plot immortalist symbol
9311 INK 6
9315 LET ra=INT (RND*8)+1
9320 FOR f=0 TO PI*2+.1 STEP .1
9330 LET r=12*(1-COS (f*ra))
9340 LET x=128+r*SIN f: LET y=90+r*COS f:
9350 IF f=0 THEN  PLOT x,y: GO TO 9370
9360 DRAW x-PEEK 23677,y-PEEK 23678
9370 NEXT f
9380 CIRCLE 128,90,50
9390 INK 7
9399 REM initialise targets
9400 RESTORE 9410: FOR f=1 TO 4: READ a(f,2),f(f,2): LET l(f,2)=a(f,2): NEXT f
9410 DATA 10,1,11,1,15,30,11,30
9420 REM scaling,fixed,last,dimensions 1230, 1=rnd control, 2=usr control
9430 RESTORE 9440: FOR f=1 TO 4: READ f1: LET f(f,1)=f(f,2)+f1: LET a(f,1)=a(f,2)+INT (4*RND): LET l(f,1)=a(f,1): NEXT f
9440 DATA 1,1,-1,-1
9450 RETURN
9499 REM print markers
9500 FOR g=1 TO 2
9510 FOR f=1 TO 4 STEP 2: PRINT AT f(f,g),a(f,g); INK 3+g;p$: NEXT f
9520 FOR f=2 TO 4 STEP 2: PRINT AT a(f,g),f(f,g); INK 3+g;p$: NEXT f
9530 NEXT g: RETURN
```

PROGRAM OF THE WEEK

4-D Resurrection

by John de Rivaz

Mastermind

on Vic20

This program is a version of the well-known board game for the Unexpanded Vic20. It makes use of sound and graphics and has full instructions included in it. Some lines will have to be entered in their abbreviated form, eg. P [*Shift*]-O for *Poke*.

The program works by generating a random number between one and nine to go in each of the elements of the array N(4). Before the digit is put in the array it is compared with each element. If it is the same as one of them it is disregarded and another random number generated (Lines 100-140).

The main loop of the program takes the user's input, checks it is four characters long, then splits it up one digit to each element of the array G(4) (Lines 200-230). Then each of the digits in G is compared with the corresponding digit in N. If they are the same, the 'right digit in right place' counter is incremented (Line 240). If they are not the same the digit is compared with all of the digits in N and if it matches one of them then the 'right digit but wrong place' counter is incremented (Line 250). If all the digits are in the right place the program jumps to the 'Win' routine at line 400.

If not, the cursor is moved to a position just to the right of where the user's guess is on the screen (Line 290) and a check is made to see if there are any digits in the right place. If not, the program skips line 300 which prints the correct number of shifted-Q's and makes an appropriate beep.

The process is repeated, only checking for the number of digits that are correct but in the wrong place. A shifted-W is printed and a beep made for each one (Line 305). If there are none, a jump is made to the 'Nothing Right' bit which make a long low noise to inform you. Finally the cursor is moved down two lines and the guess counter is incremented. If it is more than 10 a jump is made to the 'Lose' routine. If not the program goes back to get another guess from the player.

The 'Win' routine give you the relevant information while rapidly decreasing the Volume and Screen Colour Registers. Then the 'summing up' routine tells you what the number was by printing each element of N in a row and then it gives you the option of another game. The losing routine turns the screen red and makes a low noise while telling you what happened. It then goes to the 'Summing Up' section.

N.B. The *Pokes* in lines 45 and 51 are to turn the cursor on so it flashes while the program waits for you to hit a key. It is turned off again in Line 51.

Main variables and arrays

S1 Lowest Voice
S3 Highest Voice
V Volume
CL Screen and border colour register
NN Random number between 1 and 9
J Used in loops
R Used in loops
GN Number of guesses.
CC Number of digits in right place
C Number of digits correct but in wrong place
X$ Used to hold the prompt for the player, usually 'Guess'. The only time this is changed is when GN=10 and then the space in front of the word 'Guess' is removed so that all the player's guesses will line up on the screen.

Arrays

N(4) Used to hold number chosen by computer
G(4) Used to hold guess input by player
N.B. Theses do not have to be DIMmed since they contain less than 10 elements.

```
1 rem#######mastermind
2 rem#######by michael clarke
3 rem#######ensure lower case when typing in
4 rem#######leave out rem statements if not
  required
5 gn=1 print"■■",chr$(14) s1=36874 s3=36874
  +2 v=s3+2 cl=v+1 pokev,15 pokecl,25 x
  $=" guess"
10 print"*************************",
20 print"$****■MASTERMIND■*****$*";
30 print"*************************"
35 print"■■by Michael Clarke"
40 print"■■instructions ■Y■ or ■N■ ",
45 poke204,0
50 geta$ ifa$<>"y"anda$<>"n"then50
51 poke204,1
60 ifa$="y"thengosub1000
99 rem#######choosing random number
100 print"■"chr$(142) forj=1to4
110 nn=int(rnd(1)*9)+1
120 ifnn=n(1)ornn=n(2)ornn=n(3)ornn=n(4)
    then110
130 n(j)=nn
140 nextj
189 rem#######main loop
190 ifgn=10thenx$="guess"
200 cc=0 c=0 printx$,gn, inputg$ iflen(g$)
    <>4thenprint"■■" goto200
220 forj=1to4
230 g(j)=val(mid$(g$,j,1))
240 ifg(j)=n(j)thencc=cc+1 goto260
250 ifg(j)=n(1)org(j)=n(2)org(j)=n(3)org(j)
    =n(4)thenc=c+1
260 next
270 ifcc=4then400
290 print"■■■■■■■■■■■■■■■■■", ifcc=0then303
300 ford=0tocc-1 print"■Q■", pokes3,200 fork
    =1to100 next pokes3,0  nextd
303 ifc=0then307
305 ford=otoc-1 print"■W■", pokes1,200 fork
    =1to100 next pokes1,0 next goto310
307 ifc>0orcc>0then310
308 pokes3,120 forj=1to300 next pokes3,0
310 print print gn=gn+1 ifgn=11then500
320 goto190
399 rem#######winning bit
400 print"■■" pokecl,76
410 print"■■■you win!!!!"
415 pokes3,200 forj=15to0step-.5 pokev,j
    pokecl,j+64 forr=1to200 next next pokes
    3,0 pokecl,76
417 print"■■you got it in" print"  ■",gn,"
    guesses!"
419 rem#######summing up
420 print"■■the number was ""print"printn(1)
    "■"n(2)"■"n(3)"■"n(4)
430 print"■■would you like to play again?
    (y/n)"
440 geta$ ifa$<>"y"anda$<>"n"then440
450 ifa$="y"thenrun
460 print"■■■■■bye bye!" pokecl,27 end
499 rem#######losing bit
500 pokecl,42 print"■■"
510 print"you ran out of guesses"
520 pokes1,200 forj=1to3000 next pokes1,0
    goto420 999 rem#######instructions
1000 print"■*****MASTERMIND******"
1010 print"The object of the game "
1020 print"is to guess the four-"
1030 print"■digit number the "
1040 print"■computer picks."
1050 print"■ None of the digits "
1060 print"■will be the same,and "
```

```
1070 Print"none of them will be"
1080 Print"  a Zero."
1090 gosub4000
2010 Print"To help you,if you"
2020 Print"get the right digit in"
2030 Print"the right Place,a "
2040 Print" Black dot will be"
2050 Print"displayed after your"
2055 Print"guess.If you get the"
2057 Print"right digit in the "
2060 Print"wrong Place a White"
2065 Print"dot will be displayed"
2070 Print"after your guess."
2080 gosub4000
2090 Print"To Play,type in your "
2100 Print"guess and Press RETURN "
2110 Print"To erase anything you"
2120 Print"have typed Press 'DEL'"
2125 Print" You have ten guesses"
2130 Print" HIT ANY KEY TO PLAY."
2140 gosub4010 return
4000 Print" HIT A KEY TO GO ON"
4010 geta$ ifa$=""then4010
4020 return
```

Mastermind
by Michael Clarke

Elements
on Vic20

This program runs on an unexpanded Vic20 It can find out the atomic number and weight of any of the 103 elements in the periodic table

Program notes

Line 1 clears the screen
Line 2 asks you to enter the element.
Line 3 reads a word from the data and two numbers
Line 5 sees if the word in the data equals Z. If it does equal Z then it goes to line 50
Lines 10-11 see if the word in the data equals the element that you have inputted If it does not then it goes to line 20
Lines 20-22 print out the element and underline it then leave one line
Lines 23-24 output the atomic number and weight.
Lines 25-29 see if you want another go or not
Line 50 tells you that the element that you had inputted was not in the table of elements.
Lines 51-56 ask you if you want another go or not.
Lines 100 onwards are data

```
0 REM ELEMENTS,BY ASGHAR AHMED,1982
1 PRINT"J"
2 INPUT"ENTER ELEMENT",A$
3 READB$,C,D
5 IFB$="Z"THENGOTO50
10 IFB$=A$THEN20
11 IFB$<>A$THEN3
20 PRINTB$"
21 PRINT"————————————"
22 PRINT
23 PRINT"ATOMIC NUMBER ="C
24 PRINT"ATOMIC WEIGHT ="D
25 PRINT PRINT"HIT Y TO GO ON OR N TO END"
26 GETN$ IFN$=""THEN26
27 IFN$="Y"THEN RUN
28 IFN$="N"THENEND
29 GOTO26
50 PRINT PRINT"NOT IN THE TABLE OF ELEMENTS
[!!]!!"
51 PRINT PRINT"HIT Y TO START AGAIN OR N TO
END"
52 GETA$ IFA$=""THEN52
53 IFA$="Y"THENRUN
55 IFA$="N"THENEND
56 GOTO52
100 DATAHYDROGEN,1,1.008
102 DATAHELIUM,2,4.003,LITHIUM,3,6.939,BERY
LLIUM,4,9.012,BORON,5,10.811
103 DATACARBON,6,12.011,NITROGEN,7,14.007,
OXYGEN,8,15.999,FLUORINE,9,18.998
104 DATANEON,10,20.183,SODIUM,11,22.990,MAG
NESIUM,12,24.312,ALUMINIUM,13,26.982
105 DATSILICON,14,28.086,PHOSPHORUS,15,30.
974,SULPHUR,16,32.064,CHLORINE,17,35.453
106 DATAARGON,18,39.948,POTASSIUM,19,39.102,
CALCIUM,20,40.08,SCANDIUM,21,44.956
107 DATATITANIUM,22,47.90,VANADIUM,23,50.94,
CHROMIUM,24,52,MANGANESE,25,54.94
108 DATAIRON,26,55.85,COBALT,27,58.93,NICK
EL,28,58.71,COPPER,29,63.54,ZINC,30,65.37
109 DATAGALLIUM,31,69.72,GERMANIUM,32,72.79,
ARSENIC,33,74.92,SELENIUM,34,78.96
110 DATABROMINE,35,79.909,KRYPTON,36,83.80,
RUBIDIUM,37,85.47,STRONTIUM,38,87.62
111 DATAYTTRIUM,39,88.905,ZIRCONIUM,40,91.
22,NIOBIUM,41,92.906,MOLYBDENUM,42,95.94
112 DATATECHNETIUM,43,99,RUTHENIUM,44,101.
07,RHODIUM,45,102.91,PALLADIUM,46,106.4
113 DATASILVER,47,107.87,CADMIUM,48,112.40,
INDIUM,49,114.82,TIN,50,118.69
114 DATAANTIMONY,51,121.75,TELLURIUM,52,127
.60,IODINE,53,126.904,XENON,54,131.30
115 DATACAESIUM,55,132.905,BARIUM,56,137.34
,LANTHANUM,57,138.91,CERIUM,58,140.12
116 DATAPRASEODYMIUM,59,140.907,NEODYMIUM,
60,144.24
117 DATASAMARIUM,62,150.35,EUROPIUM,63,151.
96,GADOLINIUM,64,157.25,TERBIUM,65,158.92
118 DATADYSPROSIUM,66,162.50,HOLMIUM,67,164
.93,ERBIUM,68,167.26,THULIUM,69,168.93
163 DATAYTTERBIUM,70,173.04,LUTECIUM,71,174
.97,HAFMIUM,72,178.49,TANTALUM,73,180.95
170 DATAWOLFRAM,74,183.85,RHENIUM,75,186.2,
OSMIUM,76,190.2,IRIDIUM,77,192.2
171 DATAPLATINUM,78,195.09,GOLD,79,196.97,
MERCURY,80,200.59,THALLIUM,81,204.37
172 DATALEAD,82,207.19,BISMUTH,83,208.98,
POLONIUM,84,210,ASTATINE,85,211
173 DATARADON,86,222,FRANCIUM,87,223,RADIUM,
88,226.05,ACTINIUM,89,227.05
174 DATATHORIUM,90,232.12,PROTACTINIUM,91,
231,85,URANIUM,92,238.07
175 DATANEPTUNIUM,93,237,PLUTONIUM,94,239,
AMERICIUM,95,241,CURIUM,96,242
176 DATABERKELIUM,97,247,CALIFORNIUM,98,
251,EINSTEINIUM,99,254,FERMIUM,100,253
177 DATAMENDELEVIUM,101,256,NOBELIUM,102,
254,LAWRENCIUM,103,257
180 DATAZ,0,0
```

Elements
by Asqhar Ahmed

ABERSOFT

48k Spectrum

The Wizard's Warriors

THE WIZARD'S WARRIORS A fast moving game that matches developments in your skill as a player in becoming increasingly more devious. By offering to you the full range of options you can choose how to control your warrior through the maze. A full implementation of the program enables such features as a continuous series of sound effects, arcade quality graphics, double-point scoring, and—for the very artful—bonus lives. — Spectrum £4.95

7th ZX MICROFAIR

FORTH A full implementation. Ideal for writing fast moving arcade type games. Allows the full colour and sound facilities of the Spectrum to be used. Future Microdrive enhancements will be made available. — Spectrum 14.95

ADVENTURE ONE Features a save game routine as the game can take months to complete. '... a remarkably good version... well worth the money.' *Sinclair User* — ZX81 £5.95

MAZEMAN A fast action m/c game that reproduces the spirit of the original. '... is very accurate and fast.' ... *Which Micro?* ... — Spectrum £4.95, ZX81 £4.45

CHESS 1.4 Ten levels of play with this m/c program. Good graphic screen display. 'In a class of it's own.' ... *Your Computer* ... — ZX81 £5.95

INVADERS Very fast m/c action. Includes mystery ship and increasingly difficult screens. — ZX81 £4.45

7 MAES AFALLEN, BOW ST., DYFED, SY24 5BA

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for LYNX, DRAGON, SPECTRUM and ZX81 Software

MONSTER MINE by W. E. MacGowan. Escape from the mine with as much money as you can but don't get caught by the prowling monsters. An addictive machine code game with superb graphics and save facility. Price (LYNX and DRAGON) £7.95. Price (SPECTRUM and ZX81) £4.95.

SULTAN'S MAZE by Christopher Hunt. Enter the 3D maze in search of the Sultan's pieces but beware, your strength may run out, or you may come face to face with the Maze Guardian. A multi-difficulty game with fantastic graphics and sound. Prices (LYNX and DRAGON) £7.95.

CHARACTER GENERATOR by John Line. A program for the programmer allowing creation and saving of character sets/shape pieces and subsequent inclusion into own basic program. Demonstration program and full ASCII character set included. Price (DRAGON) £9.95.

GEMPACK IV by W. E. MacGowan. Two great machine code games, each full of graphics. In **Sea Harrier** you must land your plane on the aircraft carrier after dispersing the weight with chemical bombs. But don't hit the ship! In **Sub Chase** you must depth charge the wolf pack without being sunk. Both with four levels of play from easy to kamikaze. Price (LYNX and DRAGON) £7.95.

CHATEAU by Pete Allen. A new type adventure in which you must wander the Count's old mansion in search of treasure! Of course, when the Count was alive he hid his treasure, he also left lots of unpleasant surprises for those brave enough to try and seek out his riches! Come face to face with Ghouls and Ghosts, Vampires and Trolls; do you run or fight? Will the mysterious Travel Agent suddenly appear and whisk you away to far off places? Where can you find the key or the lamp? Is the clock booby-trapped? Will you die a slow and lonely death, or will you win through to claim the fantastic treasures of The Chateau? Price (DRAGON) £7.95.

GAMES PACK II by Christopher Hunt.

REVERSI Pit your wits against the Lynx with this easy to learn, yet extremely demanding mind game. Five skill levels, from novice to grand master.

BRAKE. Guide the snake to the food, but watch out, he will grow and must not eat the wall or himself.

PONTOON. An excellent implementation of a favourite card game in full colour with sound. Lynx is a mean Banker. Price (LYNX) £7.95.

LYNX COMPUTING BOOK by Ian Sinclair. Excellent book, which the beginner will find an invaluable aid, in helping to utilise the LYNX'S many useful features! Price £6.95

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TRADE ENQUIRIES WELCOME — PLEASE RING FOR DEALER PACK

React

on Dragon 32

Full instructions for playing this game are given in the program

Program notes

Lines	Notes
10-140	Set up game and players
150-200	Resets variables. Line 200 ensures that last button pushed is not remembered otherwise cheat sequence is initiated
210-220	Delay and timer reset
310-480	Game sequence. Checks who reacts first and adjusts score as well as indicating on the screen
490-570	Checks scores and displays on screen. Counts games and if less than three returns to start
580-590	Another go
1000-1180	Instructions
2000-2020	Musical delay and scores

Variables

Variable	Meaning
N1$	Left hand player
N2$	Right hand player
L1	Total left score each game
R1	Total right score each game
D1	Total draws each game
C	Count tries each game
L,R,D,T	Contest totals
CH$	Keyboard check for cheating
TI	Varies timer when playing against the dragon

```
10 CLS
20 PRINT@205,"react":PRINT@288," WRITTEN FOR THE DRAGON
   32 BY    R. LOCK   APRIL 1983."
30 PRINT:PRINT:INPUT" INSTRUCTIONS (Y/N)";A$:IF LEFT$
   (A$,1)<>"Y" THEN 50
40 GOSUB 1000
50 CLS:PRINT@192,"NAME PLAYER 1 (LEFT)":PRINT:PRINT"
   (DRAGON IF PLAYING THE COMPUTER)"
60 INPUT N1$
70 IF LEN(N1$)>10 THEN PRINT"I DON'T BELIEVE THAT!":
   FOR I=1 TO 1000:NEXT I:GOTO 50
80 IF N1$<>"DRAGON" THEN 100
90 PRINT:INPUT"      DIFFICULTY(1-10)";TI
100 IF LEFT$(Y$,1)="Y" THEN 150
110 CLS:PRINT@192,"NAME PLAYER 2(RIGHT)";:INPUT N2$
120 IF LEN(N2$)>10 THEN PRINT"I DON'T BELIEVE THAT!"
   :FOR I=1 TO 1000:NEXT I:GOTO 110
130 CLS:PRINT@192,"JOYSTICKS OR KEYBOARD (J/K)";:
   INPUT A$
140 IF A$="J" OR A$="K" THEN 150 ELSE 130
150 T=0:L1=0:R1=0:D1=0
160 CLS:IF T=0 THEN  PRINT@203,"FIRST GAME":FOR I=1
   TO 2000:NEXT
170 IF T>0 THEN PRINT@203,"NEXT GAME":FOR I=1
   TO 2000:NEXT
180 C=0:D=0:L=0:R=0
190 IF C=10 THEN 500 ELSE CLS4:PRINT@202,"WAIT FOR IT!";
200 P=255:B$=INKEY$
210 N=RND(2000):FOR I=1 TO N:NEXT I
220 IF N1$="DRAGON" THEN TIMER=TI ELSE TIMER=0:IF A$
   ="K" THEN 260
230 P=PEEK(65280)
240 IF P=125 OR P=253  THEN P=125: GOTO  300
250 IF P=126 OR P=254  THEN P=126:GOTO  290
260 CH$=INKEY$
270 IF CH$=CHR$(9) THEN P=126
280 IF CH$=CHR$(10) THEN P=125
290 IF P=126 THEN CLS3:L=L+1:C=C+1:PRINT@37,"CHEAT!"
   ;:FOR I=1TO30:SOUND 150,1:NEXT:GOTO 190
300 IF P=125 THAN CLS5:R=R+1:C=C+1:PRINT@34,"CHEAT!"
   ;:FOR I=1TO30:SOUND 220,1:NEXT:GOTO 190
310 CLS:PRINT@270,"GO!"
320 SOUND10,1:PRINT@200,
330 IF A$="J" THEN 410
340 B$=INKEY$
350 PRINT@110,TIMER
360 IF N1$="DRAGON" AND TIMER>23 THEN 430
370 IF B$=CHR$(9) THEN P=126
380 IF B$=CHR$(10) THEN P=125
390 IF B$="" THEN 340
400 GOTO 440
410 P=PEEK(65280)
420 PRINT@110,TIMER
430 IF N1$="DRAGON" AND TIMER>23 THEN P=125
440 IF P=124 OR P=252 THEN PRINT@237,"DRAW!":D=D+1:
   PRINT@270,"    ";:SOUND 50,5
450 IF P=126 OR P= 254 THEN PRINT@277,N2$:R=R+1:
   PRINT@270,"        ";:SOUND 150,5
460 IF P=125 OR P=253 THEN PRINT@258,N1$;L=L+1:
   PRINT@270,"    ";:SOUND 220,5
470 IF P=255 OR P=127 THEN 410
480 FOR I=1 TO 1000:NEXTI
490 C=C+1:GOTO 190
500 T=T+1:CLS:PRINT@74,"GAME OVER
510 PRINT@137,N1$;L,         N2$;R,,,  "     DRAWN";D
520 PRINT@225,"TOTAL AFTER GAME";T
530 IF T=3 THEN PRINT@325,"TOTAL(CONTEST OVER)":GOTO 540
540 L1=L1+L:R1=R1+R:D1=D1+D
550 PRINT@421,N1$;L1,        N2$;R1,,,  "     DRAWN";D1
560 GOSUB 2000
570 IF T=3 THEN 580 ELSE  160
580 PRINT:PRINT"   ANOTHER CONTEST (Y/N)";:INPUT Y$
590 IF LEFT$(Y$,1)="Y" THENPRINT:PRINT:PRINT:GOTO 60:
   ELSE END
1000 CLS:PRINT@64,"THIS IS A GAME TO TEST YOUR
   REACTIONS AGAINST AN OPPONENT";
1010 PRINT"   WHO CAN BE A FRIEND OR THE      COMPUTER.
   IF YOU PLAY A FRIEND ";
1020 PRINT"  THEN ENTER HIS/HER NAME WHEN    REQUESTED.
1030 PRINT:PRINT"IF YOU WANT TO PLAY AGAINST THE
   COMPUTER THEN ENTER  DRAGON ",
1040 PRINT"     AS THE LEFT HAND PLAYER. YOU
   CAN CHOOSE A YOUNGER DRAGON(1)  OR "-
1050 PRINT"AN OLDER MORE EXPERIENCED    DRAGON UP TO
   DRAGON LEADER(10).
1060 INPUT" PRESS ENTER WHEN READY ";C$
1070 CLS:PRINT@32,"THE REACTION INDICATOR IS GIVEN
   TOP CENTRE AS A GUIDE.";
1080 PRINT"IT NEEDS  TO BE LESS THAN 23 TO BEAT THE
   DRAGON LEADER."
1090 PRINT:PRINT" WHEN YOU GET THE  GO  SIGNAL
   PUSH THE JOYSTICK BUTTON OR....
1100 PRINT" IF YOU USE THE KEYBOARD THEN    THE DOWN
   CURSOR IS LEFT";
1110 PRINT" AND      THE RIGHT CURSOR IS RIGHT."
1120 PRINT:INPUT" PRESS ENTER WHEN READY";C$
1130 CLS:PRINT@32,"IF YOU CHEAT YOU WILL GIVE THE
   POINT TO YOUR OPPONENT....";
1140 PRINT" BUT  REMEMBER THAT A DRAGON NEVER CHEATS!"
1150 PRINT:PRINT" YOU CAN DRAW WHEN USING THE JOY
   STICK BUTTONS";
1160 PRINT" BUT NOT WHEN AT   THE KEYBOARD OR WHEN
   PLAYING    THE DRAGON."
1170 PRINT:PRINT" YOU HAVE THREE GAMES IN EACHCONTEST.
1180 PRINT:INPUT" PRESS ENTER TO CONTINUE ";C$:RETURN
2000 A$="O3L8ABCDEFG;P4;O3L8GFEDCBA;P4;O3L8ABCDEFG;
   P4;O2L8GFEDCBA"
2010 PLAY T4 +A$
2020 RETURN
```

React
by R Lock

Function X

on Vic20

This is a program for the unexpanded Vic20 which can be easily modified for use with any computer as it doesn't use any special feature of the Vic. This program will allow you to solve any equation located in line 28. Enter it like this: 28 DEFFNF(X) = SIN(X −5)/X

The study of the roots will be limited by A and B which are given by the user. The step is the amplitude between two tests. Be sure that there is only one root between two steps! If you don't know anything about the function give a small value to the step (such as .01). It will take a little longer but you'll be sure to get all the roots.

A usual value for the step is 1. The value of the precision can be any number superior to 1e — 10.

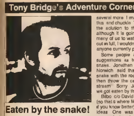
Program notes

Lines	
1-8	Presentation
13-23	Menu
28-45	Introduction of the limits of the study, step, precision
46	Send to 130 for roots
51-55	Give results — END
130-152	Find the roots

```
1 REM ################
2 REM #     F(X)=0    #
3 REM ################
4 REM #      BY       #
5 REM # CYRIL AUBRY   #
6 REM ################
7 REM # JANUARY 83    #
8 REM ################
13 PRINT"■"
14 PRINT"■ RESOLUTION OF F(X)=0 "
15 PRINT:PRINT
16 PRINT"1,INTRODUCE YOUR        FUNCTION IN LINE 28."
19 PRINT"  E.G. 28 DEF FNF(X)=..."
20 PRINT "■2.INTRODUCE A,B WHICH    WILL BE THE LIMITS    OF THE STUDY.",
21 PRINT"THEN      INTRODUCE THE STEP.   BE CAREFUL:NO MORE      THAN 1 ROOT BETWEE
N",
22 PRINT"   TWO STEPS."
23 GETA$:IFA$=""GOTO23
28 DEF FNF(X)=3*(X-7)*(X+3)*(2-X)*(5*X-2)
34 DIMRA(30)
36 PRINT"■LIMITS "
38 INPUT"     A=",A
40 INPUT      B=",B:IFA=BORA>BTHEN38
41 PRINT"■STEP
42 INPUTDX
43 PRINT"■PRECISION REQUIRED "
44 INPUTER
45 PRINT
46 GOSUB130
51 IFCI=0THENPRINT"■NO ROOTS IN [A B]":END
52 PRINT"■■■■■■■■■■":FORI=0TOCI-1
53 PRINT"■ROOT NO  I+1   X=",RA(I)
54 NEXTI
55 END
130 CI=0
131 XF=A:XI=A
132 IFFNF(A)=0THENXC=A:GOTO149
133 IFXI>BTHENRETURN
134 XI=XF
135 XF=XF+DX
136 XA=XI:XB=XF
137 Y1=FNF(XI)
138 Y2=FNF(XF)
139 IFY2=0THENXC=XF:GOTO149
140 IF(Y1*Y2)>0THENGOTO133
141 XC=(XA+XB)/2
142 TE=FNF(XC)
143 T2=XB-XC
144 IFT2<=ERTHENGOTO149
145 IFFNF(XA)*TE>0THENXA=XC:GOTO148
147 XB=XC
148 GOTO141
149 REM
150 RA(CI)=XC
151 CI=CI+1
152 GOTO133
```

Function X
by Cyril Aubry

Tony Bridge's Adventure Corner



Eaten by the snake!

Recently I mentioned all the letters that I've received from all over the world in another mailbag recently. I opened (amongst many others!) two letters which caught my attention for reasons other than the topics the writers raised about adventuring. The first was from a dentist, and the other from one of the unfortunate 3 million unemployed.

Another sort of letter I get is signed from "A D Venture (aged 14)", or from "Mina Tcur (aged 9)" — although curiously none are from "Mrs Ida Zaptit (aged 52)", or "Mr Gein (aged 26)"!

So, as you can see, adventurers are of all ages and from all over the world. Fortunately I see no trend or bias in any of the letters toward any particular group, unless it is towards anybody who enjoys passing a few hours in a fantasy landscape solving a few conundrums.

Many people have written to me over the weeks concerning my comments on the mainframe program that really originated all the adventures around now — Crowther's *Colossal Cave*. Special thanks here to J D Swan, of Oldham, and Eric Sakura of Ontario, for supplying (in sealed envelopes) detailed maps and diagrams of their journeys through the caves. Thanks also to the reader whose name was a squiggle, who reckoned that I should give up if I couldn't solve even the first problem that I came across!

Let's carry on with the mainframe adventure. I think it would be a good idea to encode the solution to the current problem (the Green Snake) with a bit of code. Run the program I gave you a couple of weeks ago and you'll see what we are going to do to get on to the next location.

As many of you pointed out, I should also have found, at an earlier location, a bird flying about — to get it in the cage we have to drop the rod, which scares the bird. Now, to the snake. Enter the coded message and see what happens next.

ffiih • eyrhrig • s • feed •• hinae • —wthew • b—reska

We'll find out what happens now when we next return to the adventure. Any of you currently playing Level 9's *Colossal Adventure* or Abersoft's *Adventure* (and several more, I imagine), will recognise all this and chuckle. This is why I've encoded the solution to the present problem — although it is going to be very helpful to many of us to watch an adventure played out in full, I wouldn't want to spoil the fun of anyone currently playing similar games!

Some people sent in some amusing suggestions as to what to do with the snake. Jonathan Weekes (age 11), of Norwich, said that we ought to "hit the snake with the rod, put it in the cage and then throw the cage and snake into the stream". Sorry Jonathan, it didn't work, we got eaten by the Snake!

Bilbo c/o David Harrison of Burgess Hill (so that's where Middle Earth is — tell me if you know better) sent me several weird ideas. One was "hypnotise snake by waving lantern in front of him, then slug him with rod" or "polevault over snake using rod". How about "Commit suicide by eating birdcage"? Unfortunately, David — er Bilbo, adventure programs are (usually, anyway) more logical than that, and respond to humour with "I don't understand". However, let me know of any funny adventures you've played (or written?), and I'll write about them in this column.

The same Bilbo is, amazingly, asking for help in the Goblin's Dungeon in, of course, *The Hobbit*. Many, many people ask for help in the same location, and all I can say is — ask a friend to help! Can I have a definitive solution of *The Hobbit* from someone who has solved the whole adventure?

James Hanson, of Acomb in Yorkshire, is in the middle of the adventure tape from Program Power for the BBC machine. Can anyone help him trap the owl and get out of the dungeon?

Finally, remember "*Balrog is gorlab spelt backwards*!" That gem is from John Shiels of London N4. Well, no one's going to argue with you, John! Come and see us at the *Riaforcim* at *Ecalap Ardnaxela*!

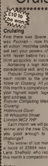
● *Kill*. This is self-evident of course, but you may use it in some surprising ways. You might find, for instance, that you are rewarded for *Killing* a main character — if you are totally stuck, first *Save* your present position in the adventure, and then get sadistic! *Kill* everything around you, you could get a surprise! In *Knight's Quest*, Mike Farley's adventure for the Spectrum, it is actually necessary to kill off one of the characters to progress. ■

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

Cruising & Blind Alley

£10 to be won

Can you beat the new high score?



Cruising

First there was *Space Invaders*, then there was *Pacman* – now there is *Cruising*. This all action, machine code, arcade type game will test your powers of co-ordination to the limit. Never before has a game asked you to think so quickly, or move so fast.

Achieving a high score on *Cruising* takes considerable skill, and not a little patience.

Popular Computing Weekly is offering £10 each month to the player with the highest score on *Cruising*. All you have to do to enter this month's competition is send a print-out of your highest score, together with your name and address, to:

Popular Computing Weekly
Cruising
Hobhouse Court
19 Whitcomb Street
London WC2 7HF

Each month we will publish the name of the winner and the new *Cruising* high score. Are you good enough to accept the *Cruising* challenge?

The winner of last month's competition with a score of 22664 was I C Wills of Shore Lane, Sheffield, who receives £10. Entries for this month's competition close on June 30.

Notes

1) Each entry must consist of a ZX printout and your name and address.
2) Closing date for this month's *Cruising* challenge entries is June 30.
3) The highest score each month will receive £10.
4) High scores cannot be transferred from one month to another.
5) The judges' decision is final.
6) No employees of Sunshine Publications Ltd, or their families, will be eligible to enter.

Blind Alley

Blind Alley is a game of strategy. In order to win you must outwit the computer, using your craft to fence in and finally destroy the enemy pursuit vehicles. But watch out for the solid trail left by your opponents — one touch is fatal!

Each month *Popular Computing Weekly* is giving away £10 to the player with the highest score on *Blind Alley*. To enter this month's competition simply send in a copy of your score and the code at the bottom of the score table, together with your name and address to:

Popular Computing Weekly
Blind Alley
Hobhouse Court
19 Whitcomb Street
London WC2 7HF

The winner of last month's competition with a score of 93235 was Peter Lee of Birmingham. Entries for this month's competition close on June 30.



OUT OF MEMORT

Matthew Bradshaw of Windsor Avenue Cheam, Surrey writes

Q I have recently acquired additional RAM to make my Spectrum up to 80K of memory I can *Load* programs for 48K Spectrum with no problem. However, when I try to set up an array such as *Dim A$ (50000)*, using more than 48K of memory, then the program stops with the error report 'Out of Memory' I would be grateful if you could tell me how to gain access to the additional 32K of memory I have heard that it is something to do with the *Out* command.

Also in a recent issue you said that a Phillips tape recorder with only Din sockets would not work with a Spectrum. I have a Phillips and it works perfectly well with a Din plug at one end and a jack plug at the other, although another lead is required to *Load* a program as this is connected to the ear socket of the recorder I bought my leads at a local Tandy branch.

A It is a common misconception that just by adding extra RAM a computer will be able to do more because it has more memory Although strictly speaking this is true in fact it does not take into account the fact that a Central Processing Unit has a limit on how much memory it can deal with at once

With the Spectrum we are dealing with a Z80 processor (although in this case we might just as well be dealing with a 6502 or 6809) All these are 8 bit chips with a 16 bit addressing capacity In effect this means that the maximum amount of memory space that it can address at once is 64K 65,536 addresses Picture it as a train that can pull eight units, itself and seven carriages You might have five or 50 extra carriages in the depot, but the single engine cannot pull them all at once It would have to stop, unhook some, and hook in some more In computer terms this is called switching out and switching in You switch out a block of memory, and switch in another block into the empty space Assuming that it has a program in, a block of memory that has been switched out will not lose its contents, you just will not be able to use them

The second point is that though a C P U is capable of addressing 64K of addresses, not all of that can be occupied by the RAM Some is occupied by the ROM (16K in the Spectrum) and some is RAM that is earmarked by the ROM for its own use (7K in the Spectrum) So you can see that the line *Dim A$* (50000) is trying to reserve a space of 50,000 bytes or adresses Yet the Spectrum has only 48K RAM available minus 7K leaving 41K user available (A 16K Spectrum has only 9K users available) This is not a particular 'trick by Sinclair, as every computer has to reserve space for the ROM and the ROM in turn has to use some space in the RAM The numbers might be different, but it is wise when checking through advertisements to look for 'user available memory'

As for the problem with your 80K you will have to contact the company where you bought the chips, for details of how to switch in and out the extra memory

WEATHER REPORT!

Harry Burrows of Wealden Way Thanet Kent writes

Q I use a BBC computer at school and I am thinking of getting a micro for my birthday. What I would like to know is if you know of one that has a program that can help me with meteorology — preferably for the Dragon, Spectrum or the Oric, as they are the computers I am thinking of buying

A I am afraid that I have drawn an almost complete blank, I am not sure from your letter whether you want some sort of database for comparing statistics and keeping records of if you actually want a teaching program If you want the former than I would suggest that you look at one of the 'calc' type programs for the Spectrum, such as *Omnicalc*, that were reviewed in *Popular Computing Weekly*, issue 15

If you want a teaching program then the only one I found that might be of any use to you is called *Weather* from Heinemann Unfortunately, it costs £23 and is for the RM380Z The only reason I mention it is that the 380Z is quite common in schools and it is possible that another school in your area has it and might let you look at it However I think that the price of the RM380Z is somewhat beyond what can reasonably be considered a home micro

VIC RENAISSANCE

Glen Lucas of Oxford Road, Waterloo, Liverpool writes

Q I own a Vic20 and I have just read a book on programming the 6502. Despite searching through all my documentation, I am unable to find a memory map showing the starting address of BASIC, Machine Code and so on. I would be obliged if you could give me some advice.

A Your question is one of several that I have had along similar lines in the last few weeks Indeed if my postbag is anything to go by, the Vic seems to be having a Renaissance

The book I would advise you to look at is Nick Hampshire's *Vic Revealed* published by Nick Hampshire Publications You should be able to buy it from your nearest Vic dealer, it is stocked also by Maplinsa and the Spectrum group of shops The position of BASIC starts will depend on how much memory you have available If you have 6 5K or less available, then your memory will start at hex 1DFF and work down towards 03FF (hex) If you have more than 6 5K User RAM then the screen will be moved to 1000 (hex) and the user available RAM will start at 2000 (hex)

SIMPLE CHORES . . .

Mr A Doughty of Liverpool Road Southport writes

Q I have been thinking about buying a home computer, and one of the main things I will want it for will be to run simple word processing chores. I do not need anything elaborate or expensive and I do not need to have a proper keyboard, as most of the stuff I want to print will be quite repetitive, and will only need minor alterations The sort of range I had in mind was from £100 to £300 which is about Oric to BBC 'A'. I would be grateful for any advice.

A Most of the popular home micros have a word processing package available for them The ZX81 has *Tasword* and there is a version for the Spectrum, *Telewriter* and *Text Star* for the Dragon and *Wordcraft* for the Vic-20 The Atari 800 and BBC 'B' also have word processing packages, but the total cost would be well outside your bracket

Despite the fact that you say that you do not want a proper keyboard it is a definite advantage You do not say what sort of printout you want, and again this depends on price but if you want a cheap printer then the new Tandy CGP 115 will give you four colour printout on 4½ inch paper for £150 The Seikosha (£200) will give you a much faster print-out on normal computer paper

Bearing all this in mind, I think that your best bet would be to look at a Dragon with *Telewriter* or if you want fewer facilities and a cheaper price the *Textstar* The Dragon has a Centronics Interface, which should give it access to a number of printers

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardamore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF



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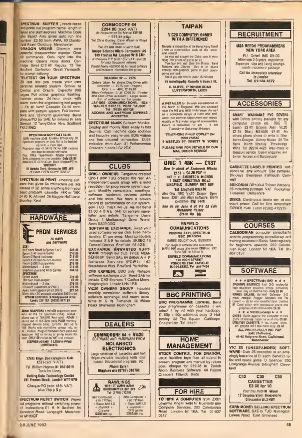
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VIC20 + cassette + 16K Ram, joystick, 2 cartridges, PR guide, Introduction to Basic 1, 6 months old. £130. Tel 01-647 0671

FOR VIC20 Stack 40/80 column card £50, Stack Vic Kit 1 and 3 + 3K Ram £30. All one month old. Also Vic games £4. Tel 051 4300908

VIC20 + CN2 + 8K + 5 books + software over £600, including over 40 cassettes + also cartridge, dust cover, also joysticks, only six months old, give away £250. Tel 01-574 4122 after 5 pm

COMMODORE VIC20, C2N cassette deck, Super Expander cartridge, one joystick, arcade software, Programmers Reference Guide, manuals and magazines. £159 the lot. Tel Sussex 0324 714582 evenings

VIC20 with cassette deck, joystick, 18 games software, 3K Ram expansion + 1 cartridge game. £165. Unique occasion. Tel 235 7233

VIC20 + cassette unit, 16K, 3K super expander, speech synthesiser, 3 slot motherboard, programmers aid cartridge, 2 games cartridges + £200-worth of games cassettes, 2 joysticks, Stack light pen + dust cover. £350 ono or swap Apple 2 or BBC. Tel Hertford 54619

VIC20 + cassette recorder, hi res graphics cartridge, £35 of software + books, all as new, boxed. £200. Tel (0734) 732 328

VIC20 cartridges Star Battle + Jelly Monsters. £10 each. Harpenden (05827) 6232 (6 pm)

VIC20 still under guarantee plus cassette unit, dust cover, software. £160. Tel 021-327 4086 after 5 pm

VIC20, C2N, 2 cartridges, tapes, 6 months guarantee. £160 ono. Tel Melton Mowbray (0664) 68402

VIC20 + cassette deck £123 ono. Tel Weston Super Mare 414519

VIC20, C2N cassette, guarantee, boxed, 8K Ram, super expander with 3K, Introduction to Basic Part 1, joystick, Star Battle cartridge, lots of games, cassettes, books. £183 ono. Tel 061 848 3745

VIC20 16K + super expander + Arfon motherboard + 10 cartridges including Chop Lifter, Spiders of Mars, lots of books + tapes. Tel for details. Peter 577 2475

For sale

CHESS MATE computer, 10 levels beginner to grand master, very strong and very quick, compact. £50 ono. Tel 01-590 9425 (after 6 pm)

CORTEX 16 bit computer, 64K and colour, cost £450 + buying house — hence — £375 ono. Tel Guildford 0483 31040

SHARP MZ, 80K, excellent condition + Basic + manual + £40 of software. £250. Tel Glasgow 041 3341978

OSBOURNE O1 computer, 64K with twin discs + monitor + software (including Mailmerge, Wordstar), Supercalc, C Basic and M Basic, still under guarantee, original price £1,275+vat, for less £850. Chelmsford 322283

VIC 20 3 cassettes £5 each, 1 cartridge £10. Tel 0908-737224

SWAP, my Mamiya C330 twin video reflex camera with 80mm lens for your 48K Spectrum. Tel Biggin Hill 75047

SWAP Choplifter for Vic 20 for Tank Attack. Tel 515-4086

DRAGON Ieel Calixto Island adventure game. £5, or swap for Madness and Minotaur. Tel 021-5532084

SWAP Vic 20 adventure cartridge — The Count — for Adventure Land. Tel 0570-470362

16K RAM PACK, Vic 20 £30. Stack supercharger plus £40. Call Binden Abbey #62195 (after 5 pm)

JUPITER ACE brand new, complete with leads, power supply + manual. £70 ono. Tel King's Lynn (0763) 2656

EXCHANGE YOUR SOFTWARE WITH ME. Send a sae to M A Valentine, 1014 Underdale Road, Monkmoor, Shrewsbury, Shropshire SY2 5EF

SOFTWARE FOR VIC20. Cartridges £10, original cassettes £3. All leading software houses. Sale due to change of machine. Tel Preston Lancs 0772 323148

SWAP COMMODORE VIC64 + cassette + program reference guide, latest games, carrying case for BBC Model 2 or sell for £375. Tel Worthing 0903 36763

VIC20 16K Ram pack £35. Tel 041-9460242

JUPITER ACE, £75 ono. Tel. 061 683278

COLOUR GENIE 16K, 4 months old, hardly used + cassette + £30 of software. £163 ono. Darren 0664 72275 after 6 pm

VIC20 cartridges for sale. Tel 08956 38564

8 TAPES including Arcadia, Meteor Star, Spectres, Orbiter etc worth about £56, sell for £30 or best offer. Tel 0744 26263 after 4.15 pm

16K ZX81 PROGRAMS Bugbyte Invaders £2.50, Bugbyte Mazogs £5, Flight Simulation £4.50. Tel Peter 061-2242715

7 ARCADE GAMES for Spectrum (16K) includes 3D Tunnel, Spectral Invaders, Avenger, Meteor Storm, Space Intruders, Spectres etc. £3.63 each ono. Tel 0825822 375 after 4.33 pm

VIC20 CARTRIDGES Sargon 2 Chess £15, Alien £12 or swap for Omega Race. Tel Southampton 458361

MATELL INTELLIVISION + voice synthesiser + 13 cartridges, also 3 voice cartridges, £200 ono. Tel Derby 764595

DEMON ATTACK for Atari VCS to exchange for Parker Starwars cartridges. Tel 06612 70319

VIC20 SOFTWARE original by Rabbit, Commodore, Pixel, all original, same half price. Tel Yateley 872310

SHARP MZ80K COMPUTER, 8 languages, word processor program, 100 program library. £360. Tel Tewkesbury 297579

ALL SHARP 48K SYSTEM, MZ80K interface unit, printer, manuals, software. £550. Tel 03564 7220

VIC20 mission impossible, will swap for Choplifter or Astroblitz. Tel 025-672 3445 after 4 pm

MATTEL INTELLIVISION TV GAME with 11 cartridges. Sell for £183 ono or swap for Atari 400 + cartridges. Tel 0925 51753

BBC MODEL B compatible 4-colour graphic printer by Tandy. Hardly used. £115. Tel 0344-886125 (anytime)

PRINTER, Seikosha GP 100A. Six months old. Owner upgraded. £170 (new cost at present £230). Tel 09062 72846

VIC20 16K RAM PACK. Tel 08956 38564

ZX81 16K. Full size Fuller keyboard, £123 of software, 25 cassettes, tape recorder, magazines and video. £95. Tel 01-263 3468

TWO VIC20 CARTRIDGES Alien and Superlander £10 each, swap for Gorf or Choplifter. Tel 01-301 2175

VIC20 Starbattle cartridge. Swap for Jellymonsters cartridge. Tel 021 5560775

SPECTRUM GAMES to swap or sell, wide selection. Tel Diss (0460) 74867 after 6 pm

SWAP VOODOO CASTLE for The Count. Tel 01-515 4686

THE SPECTRUM sound board and joystick interface, creates own sound effects and uses joysticks in own programmes + one free joystick. £80. Tel Bargoed 833725 (M Glamorgan S Wales)

MATTEL INTELLIVISION video game + seven cartridges. £100. Also other cartridges available. Tel Bristol 649441

VOX BOX speech synthesis for exchange, want Vic machine code compiler (basic and sec machines). Tel 01-840 3610 after 5 pm.

SWAP following used ZX81 software, Trader, Invaders, Phoenix Adventure, Galaxy Warrior for Timegate for Spectrum. Tel Graham 0293 541936

ITT 20/20 48K with pal, soft. Runs most Apple software. £380. Tel Wigan 47574

SWAP Mission Impossible for The Count or Voodoo Castle. Tel 01 356 3582

SEIKOSHA GP80 PRINTER, parallel input, £123. Tel Bognor Regis 862905 (evenings 5 pm to 8.30 pm)

ATARI VCS complete + five cartridges £100. Tel 0773 605656

SHARP PC1211 pocket computer with applications manual, instruction manual and beginners text, £45. Tel Burnham 2356

WANTED MZ 80K £36 A in exchange for Tangerine computer and cash adjustments. Tel J Benson 0442 42387

TWO DRAGON CARTRIDGES Berserk and Alcatraz. £15 each. Tel Oldham 061-623 7368

VIC20 original cassettes for sale including Spacefreaks, Spaceattack, Asteroids and many more and also cartridges including Gorf, Chess at £15 each. Tel 01 574 4122

DRAGON 32 tapes to swap: Invaders Revenge, Salamander software Star Trek and Donkey King, all three for Compusense High Resolution cartridge. Tel Andy 01-942 5026

INTELLIVISION + nine cartridges, boxed and guaranteed. £170 ono. Tel 01 310 6109 after 5 pm

LYNX 48K as new, boxed. £200. Tel Neath (Wales) 0639-4766 (day) 3261 (evening)

VIDEO GENIE level one basic, 16K Ram, built in cassette. Canvas utilities tape. Excellent condition. £175. Tel Kettingham 226715

DRAGON 32 CASSETTES, Scarfman, Racerball, Attack, Cosmic Zap, Missile Command. £5 each. Tel 0444 413687

VIC20 Many cartridges and cassettes to swap for unexpanded and 16K, also Pirates Cove for Voodoo Castle or Count. Tel Richard New Milton (0424) 611204

48K LYNX, 3 weeks old, still boxed, in perfect condition, including manuals, PSU, all leads, software etc. Full year's guarantee and warranties. £200. Tel Waltham Cross 28173

POLARIS, £16. Gen games tape 1 £5 (Microdeal), Donkey King £6 (Personal Software Services), Attack £6 (C-Tech), Fighter Bomber £3, J Morrison Micros games tape 2 £8, DACC Flight Simulator £8. Tel Welling 043871 4383

SHARP MZ 80A, intergrated computer 48K, Basic interpretor MZ 30K, can be loaded along with other software also supplied. £200 ono. Address Roy Smith, Flat 4, Oak House, Burdrop Hospital, Wroughton, Swindon, Wilts. Tel 812 836 Ext 203

SOUND PROJECTOR with mike, screen and films worth £225. Swap for Spectrum 16K or 48K with games. 142 Northview, Swanley, Kent

Wanted

WANTED ZX81 16K with leads, manuals, software up to £60. Tel Kirkcaldy (0592) 262804 (after 6 pm weekdays, anytime weekends)

WANTED PARKER STAR WARS cartridge for the Atari VCS to exchange for Demon Attack. Tel 048 82 70319

VIC20 SOFTWARE for swapping. Call 025-671 3445 (after 4 pm)

WANTED Matell Intellivision cartridges, will swap Atari 800 cartridges and memory modules. Tel 0726 63501

BBC MICRO WANTED, new. Tel Harpenden 66152

WANTED BBC MODEL B, good condition. Tel 01-446 7109

WANTED, BBC MODEL B. Tel Southampton 32806

WANTED ZX81 Learning Lab for about £8 or swap for video cassette library cases. Tel Reading (0734) 413847 (6 pm)

WANTED BBC MODEL B exchange 23½ inch Raily Professional 531 D/B throughout, Campag, Shimano. Excellent condition. May consider Model A + 32K. Tel Pontefract 794896

WANTED, DISC-DRIVE and printer to be compatible with the Acorn Atom. Tel Jason 472 3507

WANTED ZX81, 16/32 or 64K with software in exchange for my Atari VCS including paddles, joysticks. Very good condition + PacMan, Invaders, Asteroids, Breakout games as new. Tel Southampton (0703) 844856

WANTED, Hewlett Packard 41C or 41CV + card reader modules etc. Abrams. Tel 061 427 1101 (H) 061-236 3311 Ext 206 (O)

WANTED Atari Dragon owner would like to exchange programs from his large and varied collection, everything from games to the more serious. Tel Staines 58707 (after 6 pm)

DRAGON 32's REQUIRED Cash awaits each sound machine, decision by return of post. Details to A Ellis, 22 Tumavean Road, St Austell, Cornwall PL25 5NX

WANTED to buy 8K Ram for Vic20. Tel 0341 263726 (after 5 pm)

NEW RELEASES

MAZE CHASE



Gulpman is not a new release The game was issued several months ago by Cambell Systems and has been widely reviewed

However, it is worth mentioning on this page because it has been repackaged as part of Micromega's first batch of releases

Gulpman is like *Pacman* except you are a little man who is chased around a maze by what look like frowning pumpkins — frowning presumably because you are eating their fruit However you can defend yourself with a laser, which sends the pumpkins scurrying back to their corners

Program *Gulpman*
Price *£4 95*
Micro *Spectrum 16/48K*
Supplier *Micromega*
230 236 Lavender Hill
London SW11 1LE

STRANGE IDEA

Putting programs that have been in a book on to cassette would seem to be a strange idea Who would want them? Those who have entered the programs from the book would have no need of the cassette, while those who have not entered them would not need the book in the first place

Nevertheless, a number of publishing houses have proved me wrong Melbourne House in particular, has just issued *Super Cassettes A* and *B* which contain programs from the best selling *Enter the Dragon* book

Most of the games are versions of arcade games like *Invaders* and *Asteroids* as well as a flight simulation and an Adventure game

Program *Super Cassette A and B*
Price *£5 95*
Micro *Dragon 32*
Supplier *Melbourne House*
Glebe House
Station Road
Cheddington
Leighton Buzzard
Bedfordshire LU7 7NA

SOUNDED OUT

This program is a way of producing sound effects on your Dragon with a joystick

Synth uses a mixture of Basic and machine code — instructions are also included on how to use the routines within your own programs

Program *Synth*
Price *£3 95*
Micro *Dragon 32*
Supplier *C Woods*
37 Merlpit Lane
Sutton Coldfield
West Midlands
B75 5PH

GNASHERS!

Imagine has issued a game designed to appeal to dentists and oral hygiene specialists everywhere

In *Molar Maul*, the screen displays an open mouth in which the teeth are being attacked by various kinds of bacteria

To defend your mouth from the inexorable march of tooth decay, you are equipped with a toothbrush and toothpaste As the game progresses the bacteria become more active having been invigorated by ever more sickly sweets

Program *Molar Maul*
Price *£5 50*
Micro *Spectrum 16/48K*
Supplier *Imagine Software*
Masons Buildings
Exchange Street East
Liverpool
Merseyside L2 3PN

BLASTED!

Vortex Software, a new name in the Spectrum market, has issued its first game for the Spectrum — *Android One*

The idea of the game is that you must blast your way through brick walls dodging mutants and other obstacles before a reactor blows up Your weapon in this task is an android which, though powerful can withstand only a limited number of collisions

The cassette blurb describes it as "the first in a series of real time android adventures" so presumably we should expect more android games soon — it could become a sort of macho *Hungry Horace*

Program *Android One*
Price *£5 95*
Micro *Spectrum 16/48K*
Supplier *Vortex Software*
26 Crawford Road
Hatfield
Herts
AL10 0PG

WILL HUNT

Grandad s Will is the title of a fairly black humoured adventure game from Inter Soft

The setting is Grandad s house, where the old man has passed away after hiding his will You must travel around the house looking for the will and fighting off your greedy cousin Roderick.

The blurb accompanying the cassette doesn t actually promise that you have been left something in the will, it may contain nothing — and considering the avariciousness of his relatives who could blame Grandad?

Program *Grandad s Will*
Price *£4 90*
Micro *Dragon 32*
Supplier *Inter Soft*
4 Craig Place
Aberdeen
Aberdeenshire

PAY DAY

Micro-Aid is offering a series of programs for the BBC, many of them designed for the small business

Payroll is a two-part program which will handle the wages of up to 100 employees Part one allows you to add, subtract and list P35 information and make alterations to the codes Part two calculates wages and national insurance allowing for overtime rates, sick pay etc

The company offers to update the system for £6 00 per year and will provide a manual for £2 50

Program *Payroll*
Price *£13 90 per part*
Micro *BBC*
Supplier *Micro-Aid*
25 Fore Street
Praze Camborne
Cornwall TR14 0JX

SKETCH PAD

Salamander has issued a graphics package for the BBC Model B microcomputer

The package enables drawing in modes 0 to 2 with a cross-hairs cursor Pictures created can be stored in a multi-file enabling complex drawings to be built up

The *EDG Graphics Package* also has lines boxes, arcs, shape repetition and text as standard features

Program *EDG Graphics Package*
Price *£24 95*
Micro *BBC Model B*
Supplier *Salamander Software*
17 Norfolk Road
Brighton
East Sussex BN1 4AA

NEW RELEASES

IT'S ETI



ETX is an adventure game based on the film of the same name (well two-thirds of it)

You use the keyboard to move the little alien around, collecting bits of a transmitter You are hampered by an MI5 man as well as a professor who will march you back to his laboratory should he capture you

The game features speech Should the alien fall into one of the numerous traps he will say "Ouch" — an unusual feature that is likely to be copied on other adventure games

Program *ETX*
Price *£5 95*
Micro *Spectrum 48K*
Supplier *Abbex Electronics, 20 Ashley Court, Great Northway, Hendon, London NW4*

TESTING

As part of its revision aids series, Collins has issued *Computers Study and Revision*

The book uses drawings and diagrams to test your knowledge of both hardware and software It includes questions on kinds of printer and the various types of job involved in computers

Book *Computers Study and Revision*
Price *£1 50*
Micro *General*
Supplier *Collins Educational, PO Box, Glasgow G4 0NB*

ALLWORDS

Hebrew on Spectrum allows you to input and output Hebrew words and characters

The cassette comes with a keyboard overlay complete with Hebrew characters The routines can be used to incorporate Hebrew in your own programs

The cassette is supplied with a demonstration program and the screen can be printed out on the ZX printer using the new character set

Program *Hebrew*
Price *£7 50*
Micro *ZX Spectrum*
Supplier *Michael Ben Gershon, 23a St Andrews Road, London NW11 0PH*

TEDDY'S PICNIC

Ah Diddums must have one of the most bizarre scenarios ever used in an arcade game

You use your keyboard or joystick to move intergalactic mothership? No Ion drive battle cruiser? No Munching monster? No You use it to move a little brown teddy bear

Your enemies? Not mutant aliens but gollywogs, tin soldiers, toy trains and most deadly of all, plasticine You must fight them off to comfort the crying baby

Maybe it's a deliberate attempt to appeal to both sexes and get away from the death and destruction implicit in the more conventional games In any event it should do well, following as it does on the reputation of Imagine's *Arcadia* which has become one of the most successful ZX arcade games ever

Program *Ah Diddums*
Price *£5 50*
Micro *Spectrum 16/48K*
Supplier *Imagine Software, Masons Buildings, Exchange Street East, Liverpool, Merseyside L2 3PN*

10 LEVELS

CP Software is a games house which specialises in computer adaptations of classic board games It has added *ZX Draughts* to its range of *Chess* and *Backgammon*

Although draughts may seem the poor relation of chess in fact it is particularly well suited to computer adaptation In theory, draughts' programs can be made unbeatable

This package offers 10 levels of play At level 9 which is the most difficult, the micro may ponder its move for up to 14 minutes before closing in for the kill

Program *ZX Draughts*
Price *£5 95*
Micro *Spectrum 48K*
Supplier *CP Software, 17 Orchard Lane, Prestwood, Bucks HP16 0NN*

ERROR BUG

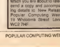
Drone is a "3D Graphic Simulation" game in which you must guide your tank through "memory tunnels" while avoiding "error bugs" seeking out the "Rom guardian" As you may have gathered it is all set inside a computer

The cassette package includes a keyboard overlay and instruction manual A talking robot called TROFF guides you through a training mode

Drone is the first release from Cable Software

Program *Drone*
Price *£8 75*
Micro *Dragon 32*
Supplier *Cable Software, 83 Neville Road, Limbury, Luton Beds*





New Releases is designed to let people know what software is coming on to the market If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases Popular Computing Weekly 19 Whitcomb Street London WC2 7HF



Lies, dammed lies and computers

"Conservative party managers yesterday relayed their computer backed advice to Mrs Thatcher to seize the opportunity of a June general election" (*Sunday Times* 8 May). And on Monday 9 May there was an announcement of an election on 9 June.

The whole tenor of the discussion following the local elections seemed to be dominated by one person or another's computer-backed projection what were they trying to do?

An MP was being shown round his local council's computer installation and asked whether it was all necessary. The computer manager assured him that it was greatly needed for many services. The MP could see that sending the rates demands and similar by use of computerised addressing was very helpful and that the paying of wages and salaries was assisted but did they need such an expensive machine? The manager said that a large computer was needed for example to work out the council's entitlement under the Rate Support Grant legislation.

"What did you do before the computer?"

"Well the formula was much simpler then and we did not need the computer."

"Then why is the formula more complicated now?"

"Well it is more complicated now because we can use the computer."

We all know that the decision to call the election will not have been really *that* influenced by the computer predictions. We know that the decision to go to a vote will have been made on rather less quantitative more qualitative gut feelings that this is an election that the Conservatives can win. To claim the blessing of a computer prediction is — I would guess — an added benefit.

David Butler the guru of political pundits during the weekend's debate about the local election results was able to show quite easily that each party's (distinctive) analysis of the results was wrong. He was also unable to give a correct analysis.

When Disraeli made his oft-repeated remark that "There are lies damned lies and statistics" he should perhaps have said "There are lies damned lies and computer-based predictions".

There again it is not just computer predictions that are different — sometimes it is the questions that are asked. MORI (Market and Opinion Research International) conducted a poll for Panorama and it showed the Conservatives to be easily in the lead.

MORI are notable in my eyes for a poll they conducted into attitudes towards Information Technology — conducted in November 1982.

As with all polls it was the way the questions were asked. Not quite "Have you ever heard about Information Technology at all in any way?" but close. Most people did not really know what IT was but thought they *might* have heard of it. This was turned into "most people know about IT".

This is not at all notable — such techniques are used by all polling organisations for all political masters of all parties. The notable event came in the Appendixes to the main report. One question was "Why did you buy a personal computer?" and one possible answer was "It was my husband's idea". When the answers were compared to the sex of the respondent, one of those who said "It was my husband's idea" was classified as *male*.

MORI found for Panorama, that if Mr Healey led the Labour Party, then the Labour Party might win. Is Mr Healey male or female?

After the computer predictions of the composition of the House of Commons during election night on the BBC (February 1974) ITN pointed out that the BBC predictions often did not add up to the correct number of total seats in the House.

Boris Allan

Puzzle

Prime Time

Puzzle No 56

The last year that was a prime number was 1979 and the next will be 1987 — a gap of eight years. This is by no means a record as even in the last few decades there occurred a gap of 22 years. Following 1951 it was not until 1973 that the year again became prime.

Several questions:

(i) Can you find the next pair of consecutive 'prime' years with a gap of 22 years?

(ii) When will there next be gaps of 24, 26 or 28 years?

(iii) What is the largest gap that has occurred to date?

Solution to Puzzle No 53

As the volumes and hence the weights of the gold spheres are in direct proportion to the cubes of their diameters we need only consider the cubes of the diameters in solving the problem.

The total weight of all 12 spheres is $1^3 + 2^3 + 3^3 + \ldots + 12^3$ units. This adds up to 6084 units so the problem becomes that of finding the cubes of 6 different integers in the range 1 to 12 which sum to half this value 3042.

```
10 LET W = 3042 20 FOR A = 12 TO 6 STEP - 1 30
FOR B = A - 1 TO 5 STEP - 1 40 LET T = A*A*A +
B*B*B 50 IF T > W THEN GOTO 220 60 FOR C = B
- 1 TO 4 STEP - 1 70 LET T = A*A*A + B*B*B +
C*C*C 80 IF T > W THEN GOTO 210 90 FOR D = C
- 1 TO 3 STEP - 1 100 LET T = A*A*A + B*B*B +
C*C*C + D*D*D 110 IF T > W THEN GOTO 200 120
FOR E = D - 1 TO 2 STEP - 1 130 LET T = A*A*A
+ B*B*B + C*C*C + D*D*D + E*E*E 140 IF T > W
THEN GOTO 190 150 FOR F = E - 1 TO 1 STEP - 1
160 LET T = A*A*A + B*B*B + C*C*C + D*D*D +
E*E*E + F*F*F 170 IF T = W THEN GOTO 240 180
NEXT F 190 NEXT E 200 NEXT D 210 NEXT C 220
NEXT B 230 NEXT A 240 PRINT A, B, C, D, E, F
```

So the weights with diameters of 1, 2, 4, 8, 9 and 12 will balance weights with diameters of 3, 5, 6, 7, 10 and 11 centimetres.

Winner of Puzzle No 53

The winner is J N Buttle, The Brow, Brecks, Rotherham who receives £10.

Top 10

Vic20

1	(1)	Panic	(Bug-Byte)
2	(3)	Cosmiads	(Bug-Byte)
3	(5)	Rank	(Commodore)
4	(8)	Blitz	(Commodore)
5	(4)	Wacky Waiters	(Imagine)
6	(9)	Introduction to Basic Part 1	(Commodore)
7	(2)	Asteroids	(Bug-Byte)
8	(10)	Amok	(Audiogenic)
9	(6)	Arcadia	(Imagine)
10	(—)	Ah Diddums	(Imagine)

(Figures compiled by Boots & Co. London)

Spectrum

1	(1)	Flight Simulation	(Psion)*
2	(2)	The Hobbit	(Melbourne House)*
3	(3)	Penetrator	(Melbourne House)
4	(4)	Transylvanian Tower	(Richard Shepherd)
5	(7)	Horace Goes Skiing	(Psion)
6	(—)	Football Manager	(Addictive Games)*
7	(6)	3D Tanx	(DK'Tronics)
8	(—)	Arcadia	(Imagine)
9	(8)	Planet of Death	(Artic)
10	(—)	Chess	(Psion)*

*Requires 48K.
(Figures compiled by WH Smith and Son Ltd.)

Atari

1	(1)	Zaxxon	(Datasoft)
2	(4)	Hellcat Ace	(Microprose)†
3	(5)	Miner 2049er	(Big Five)*
4	(2)	Astrochase	(First Star)†
5	(—)	Defender	(Atari)*
6	(—)	Legionnaire	(Avalon Hill)
7	(—)	Preppie II	(Adventure International)
8	(—)	Air Strike	(English)
9	(7)	Pharaoh's Curse	(Synapse)†
10	(10)	Protector 2	(Synapse)†

*Cartridge †32K cassette
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

Dragon 32

1	(1)	The King	(Microdeal)
2	(2)	Space War	(Microdeal)
3	(3)	Planet Invasion	(Microdeal)
4	(5)	Defence	(Microdeal)
5	(6)	Alcatraz	(Microdeal)
6	(9)	Katerpillar Attack	(Microdeal)
7	(—)	Madness and the Minotaur	(Dragon Data)
8	(8)	Chess	(Dragon Data)*
9	(7)	Wizard War	(Salamander)
10	(10)	Basic Tutorial	(Ampsoft)

*Cartridge
(Figures compiled by Boots & Co. London)

BBC*

1	(3)	Snapper	(Acornsoft)
2	(1)	Rocket Raid	(Acornsoft)
3	(8)	Chess	(Program Power)
4	(2)	Planetoid	(Acornsoft)
5	(—)	Graphs and Charts	(Acornsoft)
6	(5)	Philosopher's Quest	(Acornsoft)
7	(—)	Great Britain Ltd	(Simon W Hessel)
8	(6)	Arcadians	(Acornsoft)
9	(—)	Desk Diary	(Acornsoft)
10	(—)	Chess	(Computer Concepts)

*All Model B
(Figures compiled by Micro Management, Ipswich 0473 59181)

ZX81*

1	(4)	Flight Simulation	(Psion)
2	(3)	3D Monster Maze	(New Generation)
3	(1)	QS Scramble	(Quicksilva)
4	(7)	Chess	(Psion)
5	(—)	Catacombs	(JK Greye)
6	(8)	Space Raiders	(Psion)
7	(8)	Galaxians	(Artic)
8	(—)	10 Games for 1K	(JK Greye)†
9	(—)	Gulp	(Campbell Systems)
10	(—)	Scramble	(Woodsoids)

*All 16K except where noted. †Runs in 1K.
(Figures compiled by WH Smith and Son Ltd.)

Books

1	(—)	Spectrum Rom Disassembly *Logan*	(Melbourne House)
2	(1)	Spectrum Machine Language for the Absolute Beginner *Tang*	(Melbourne House)
3	(6)	Vic Programmer's Reference Guide *Commodore*	(Commodore)
4	(—)	Spectrum Hardware Manual *Dickens*	(Melbourne House)
5	(10)	Commodore 64 Programmer's Reference Guide *Commodore*	(Commodore)
6	(6)	BBC Micro — An Expert Guide *James*	(Granada)
7	(3)	Assembly Language Programming for the BBC Micro, *Birnbaum*	(Macmillan)
8	(2)	Enter the Dragon *Carter*	(Melbourne House)
9	(—)	6809 Assembly Language Programming *Leventhal*	(Osborne)
10	(8)	Mastering the Vic20 *Jones*	(Sigma)

(Figures compiled by Watford Technical Books, Watford 0923 23384)



SILLY TIMES

AUTOMATA U.K. LTD
all we want to do
is entertain you

PIMAN EXHIBITS HIMSELF IN PUBLIC

Horror Shock at Microfair

[illegible]

warbled the PiMan, "but when they go around being miserable about it I must act!" The crowd was reduced to a pathetic state of dancing and singing, while smiles infested their pitiful features, as the PiMan brought sanity into "the grim business of making money out of home micros."

Flogging

It's bad enough with some software companies [illegible] games that teach people to kill everything that moves [illegible]

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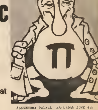
Automonopoli Threat

This reporter has conclusive proof that the notorious PiMan will be giving away bottles of cheap bubbly and fake banknotes while exhibiting his hitherto unexposed blockbuster in front of innocent men, women and children 'AUTOMONOPOLI' is rumoured to be the first game of its kind for the ZX Spectrum where the uninitiated can be tempted to play this classic game against their machine 'AUTOMONOPOLI' threatens to bring back those dark days before the digital watch and North Sea decimal coinage, when friends and family "played games together" and experienced wierd sensations known as 'pleasure', 'fun' or even the dreaded 'happiness'

Non-violent Games! Heselstein lashes out

A grim Minister of Propaganda interviewed outside the Peek 'n' Poke Club Soho, snarled "I have conclusive proof that AUTOMATA is being funded by the sinister Humorous Entertainers of the Rotund Persuasion English Section (H E R P - E S) They are trying to brainwash Britain's micro users with their non-violent, entertaining computer games, and if they are not stopped no-one will be free to enjoy killing, conquering and maiming in the privacy of their own homes "

please turn to page 94



ALEXANDRA PALACE SATURDAY JUNE 4th
THE PIMAN REVEALS HIS PROBOSCIS
Is this a clue? (photo M Whitehouse)

STOP PRESS

OFFICIAL SHOW-GUIDE TO ANY OTHER COMPUTER FAIR EXCEPT THIS ONE.

VENUE, left-luggage locker H M S Invisible Dogger Bank, Milton Keynes
TICKETS Adults £75 children £95 (cash)
HIRE OF STANDS £69 per square inch +VAT
EXPECTED ATTENDANCE 400 million(approx.)
TYPE OF VISITOR TO THE SHOW

* Wrong show/sheltering from rain. . . 32%
* Haven't got a computer/haven't got any money. . 41%
* Bogus software shops stealing free samples from stands . 16%
* Mike Johnson, smiling.. . ... 4%
* Norwegian importers ordering 800000 cassettes (honest) . 3%
* Tax inspectors pickpockets and other criminal types . 15% VAT
* Exhibitors pleading poverty . . . 97%
* Lord Lucan 2%
* Nude ladies selling violent games to children...... ... .6 9%
* Advertising reps making up circulation figures . ...± 50%
* Pimaniacs in straight jackets .. 3%
* Pimaniacs in wheelchairs 2%
* Pimaniacs trying to bribe the PiMan for clues. 1%

Latest Results:

NO ONE HAS WON THE GOLDEN SUNDIAL.. YET